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TREATMENT OF ULCERATIVE COLITIS

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The long-term management of patients with chronic ulcerative colitis is difficult, and the usual therapeutic regimens are often unrewarding. For many years various etiological agents have been postulated, including bacteria,[1] viruses,[2] enzymes such as lysozyme,[3] food allergies,[4] and vitamin deficiencies.[5] Eventually the evidence on all of these has been inadequate.[6] The present-day chemotherapeutic agents and antibiotics are apparently useful only in some acute febrile exacerbations of the disease.[7] Their failure to basically alter the course of the disorder indicates that microorganisms are probably not involved primarily. Murray [8] noted that the onset and each exacerbation of the disease occurred during periods of stressful life situations. Many investigators have corroborated and elaborated his findings.[9] Experimental studies have demonstrated the relationship between life stress and ulceration of the colonic mucosa in man.[10]

This report is based on the study of 19 unselected persons with chronic ulcerative colitis. The entire management was in the hands of one physician, who had as adjunct the services of a social worker.

OUTLINE OF THE MANAGEMENT OF THE PROBLEM

Treatment was carried out in interviews spaced at intervals of a few days or weeks, according to the apparent needs of the subject. In the interview the physician's role was that of a detached but interested, reliable, consistent and, supporting confidant. The interviews, by encouraging the patient to express himself freely, to engage in introspection, to recall, relate, and interpret dreams, and to make associations with his thoughts, feelings, and life events, were directed toward bringing about in the patient an understanding of himself and encouraging him to a more constructive orientation toward his life and the people in it.

The greatest benefit to the patient was a constructive physician-patient relationship. The patient was given opportunity and was encouraged to express with a free show of feelings, to a sympathetic and appreciative physician, the major complaints and difficulties in his life situation. The physician never criticized such feelings. He encouraged the patient to express his thoughts, and to be confident that such attitudes would not threaten his relationship with others or exclude him from the love of his closest relatives. Ambivalent feelings toward a spouse or parent were discussed, and the universality of such attitudes was explained.

Encouragement and support of the patient were freely given by the physician. These employed the warmth of human relationships. The patient's own assets and accomplishments were emphasized in building the self-esteem and self-confidence of the patient. A tolerant attitude on the part of the physician was essential. No problem could be too small to consider, and interviews

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with spouses and relatives were often necessary. Special consideration was given the patient during periods of unusual stress. The patient was made to feel free to telephone the physician at almost any time. Patients were permitted to make appointments at an earlier date than the one agreed on when unexpectedly difficult situations arose. During times of severe symptoms, the patient was seen frequently, as often as daily should the needs of the patient require such care.

Patients were given an explanation of the disease process, and this was repeated at suitable intervals, such as during periods of severe symptoms. Emphasis was placed on the participation of the bodily viscera in different moods and feeling states. In addition to the usual "routine" medical history, a detailed personal biography was undertaken. Periods of illness were correlated with periods of emotional stress.

The background, the family, the cultural setting, the emotional responses, and the aims and ambitions of the patient were explored in order to understand the patient and to help him to understand himself. In some instances it was possible for the patients to recognize the basis of their feelings and attitudes (for example, in the light of their childhood experiences) and to alter them significantly and for the better (case 1). However, many patients were unable to incorporate this knowledge into their daily behavior, and symptoms did not change. In such instances it was felt better to have the patient realize and accept his dependent position and to make the best of it, rather than to try to alter it. That the need to be cared for and loved is universal and acceptable was emphasized, as was the fact that attempts to reject the dependency are often more disastrous than the acceptance of a dependency.

The patients were instructed in means of recognizing their own manifestations of accumulating emotional tension and encouraged (1) to accept them for what they represented and (2) to attempt to deal with the circumstances leading to their presence. When the patients learned to appreciate the origin of their symptoms, they often no longer looked on them as the manifestations of a dire disease. This later phenomenon in itself helped to alleviate anxiety.

Finally, rearrangement in the environment was attempted. When successful, it produced dramatic results in terms of symptomatic relief (case 3). Unfortunately, however, this was not always feasible, often because of the lack of a practical maneuver, lack of cooperation of the family, or because of the inability of the patient to accept any drastic change.

No medication was given to the patient. The management was worked out with the patient. The patient's ability to utilize his own resources determined the final result. The physician guided him, helped him understand why he was getting into difficulty, and supported him when he was trying to alter his environment or attitudes.

Time factors were of the greatest importance in this type of management. In many instances, in hospital circumstances, an apparently spontaneous recovery took place in two or three months, representing the therapeutic effect of the passage of time and of autonomous biological forces.

The passage of time in itself was often helpful in establishing the patient's confidence in his physician. The increase in confidence frequently alleviated inhibitions and reluctance to express feelings and attitudes. Moreover, an appreciation of the appropriate moment for introducing a new concept or challenging an established attitude was essential.

Thus it would have been unwise when the patient was disturbed or having severe symptoms to threaten his security system in anyway. Difficulties in the life situation were often anticipated so that interviews might be arranged to antedate an approaching unpleasant event, such as school examinations, the undertaking of a new position, or the approaching visit of an unwanted relative.

RESULTS

During this type of management 11 of the patients showed substantial improvement. Of these 11, four patients became free of symptoms and remained so for more than a year, one of these for three years. Two patients showed slight improvement over a year and a half. Six of the 19 patients did not improve. Of these six, one died and one has had an ileostomy. These results are compared with other published series in the table.

Evaluation of the Clinical Management of Chronic Ulcerative Colitis

	Results of Treatment in Terms of Control of Symptoms			
	Cases *			
Author	Number	With Good Control, %	With Fair Control, %	With Poor Control, %
Kiefer	327	34	12	54
Bargen	871	40	17	43 (17% dead)
Present series	19	56 (11 cases)	12 (2 cases)	32 (6 cases) (1 dead)

* Cases followed two years or more.

In the group there was no direct relationship between the patients' age, duration of illness, severity of illness, and extent of x-ray changes, and the patients' ability to recover from the illness, or to make a significant improvement.

In considering the features responsible for improvement or failure to improve in the patients studied, a number of facts became apparent which are illustrated in the following case reports.

Chronic ulcerative colitis occurred in a setting of intense unexpressed hostility. A basic alteration in attitudes by the patient was followed by diminution in hostility and disappearance of symptoms in three of the 19 patients. The following protocol describes the moderately severe ulcerative colitis which began in a 36-year-old woman in a setting of intense hostility toward her husband. During a series of 17 therapeutic interviews over a six-month period the patient was able to modify her attitudes and feelings toward her husband. This change corresponded with marked symptomatic improvement, and x-ray and sigmoidoscopic studies at the end of six months revealed no evidence of ulcerative colitis. She has been free of symptoms for three years (Fig. 1).

CASE 1.—A 36-year-old graduate nurse had ulcerative colitis with continuous symptoms for four years. When symptoms were very severe she had 12 to 24 bloody rectal discharges a day.

She married, at the age of 30, a man 15 years her senior, after having rejected many suitors. Her fantasy that her husband would be a "perfect" man was soon dispelled. He was responsible for the financial welfare of his two elderly parents. This took considerable time and money as the old people were demanding of his presence and affection as well as a financial drain. He spent much time with them. As time went on the patient began to feel that he cared less for her than for his parents, and that he had many ideas and notions quite different from hers. She "felt like leaving him many times," although she did not, being afraid that she would be unable to support herself. In this situation of conflict she became more and more resentful toward him and became enraged at his slightest defect in behavior. However, she was unable to express any of this hostility, being concerned lest he leave her. She remained smiling, and no friend or acquaintance knew of the marital strife. As she became more and more uncertain of the wisdom of continuing the marriage, and bitter and resentful toward her husband, ulcerative colitis began insidiously four years before she came to the New York Hospital. She had been attended by several physicians and had had numerous diagnostic investigations.

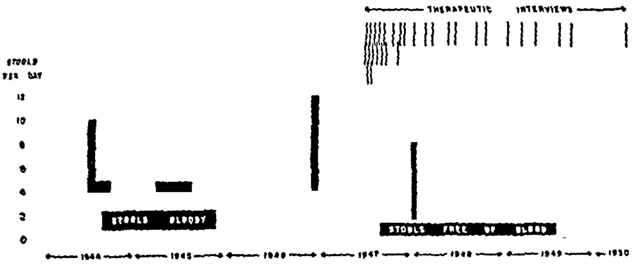

Fig. 1 (case 1).—Alteration in the course of chronic ulcerative colitis following institution of therapeutic interviews. Each short line represents one interview. The rapid decrease of the diarrhea and disappearance of blood from the stools can be noted. The patient continues to be free of symptoms even though she is being seen very infrequently. A marked change in behavior and attitudes was found to be associated with a rapid diminution in symptoms.

At the time she presented herself to the hospital, sigmoidoscopic examination revealed an engorged, hyperemic, friable, ulcerated mucus membrane as far as 22 cm. up the bowel. X-ray examination revealed spasm and shortening of the descending and sigmoid colon. Repeated cultures of the stools for pathogenic organisms and amoebae were negative.

The patient was interviewed for a total of 26 hr. She was able to work out the dynamics of her behaviour and motivations and gradually became able to accept her husband and his faults and to make the best of the situation. She found her husband sympathetic toward her in regard to her attitude toward his parents, and that he was able to tolerate outbursts of anger on her part and give her understanding. After six months the sigmoidoscopic and x-ray examination showed no structural change and the subject was not passing blood or mucus through the rectum. It is probable that this woman will be able to deal with her personal affairs more adequately in the future and remain free of ulcerative colitis. After the first six months of therapy she was seen only once in three months. She has remained symptom-free for three years.

The opportunity to express feelings of anger and hostility to a sympathetic physician was found to be sufficient to diminish the intensity of such feelings. The tranquility brought about by a good physician-patient relationship was often found sufficient in itself to result in the disappearance of symptoms even in the absence of any basic alteration in attitudes. Diminution in symptoms occurred in 5 of the 19 patients associated with these phenomena. A 35-year-old woman, discussed in the following protocol, had had severe ulcerative colitis for four years. After the establishment of a good relationship with her physician, there was a prompt diminution in symptoms, and ultimately x-ray and sigmoidoscopic examination revealed no evidence of structural changes (Fig. 2).

Case 2.—A 35-year-old woman had had severe ulcerative colitis for four years prior to coming to the New York Hospital in May of 1947. Her early life in Puerto Rico was one of extreme poverty and parental rejection and domination. At 18 years she came to the United States to seek a more comfortable life. At 21 she married a passive, dependent, indecisive man, who thrust the entire burden of family responsibility on her shoulders. She worked hard keeping her home neat and clean, and supplemented her husband's inadequate salary by doing factory work. She experienced gradually increasing resentment toward her husband during the years of their married life, and began to feel that she was living the life of a "drudge," which she had tried to escape. In a setting of intense resentment toward her husband, and a feeling of desperation over having lost a job through no fault of her own, acute ulcerative colitis began. The bloody diarrhea continued with frequent acute exacerbations up to the time of hospitalization, during which time she would have 12 or more bloody rectal discharges daily. Examination at this time revealed a severely ulcerated, friable mucus membrane from the rectum to the sigmoid colon. Barium enema showed extensive changes consisting of ulceration and narrowing and shortening of the entire colon. Repeated stool cultures failed to reveal any amoebae or pathogenic bacilli. The Frei test was negative. In the hospital she had a protracted febrile course, receiving penicillin and sulphaguanidine without benefit. An ileostomy was considered advisable, but deferred until an attempt to deal with her personal problems had been made.

During the first two hours of interview, she was extremely reticent and unable to deal with questions concerning her personal life. When it was suggested that she simply recount her biography in her own way, however, she was able to talk more freely. Shortly thereafter she began to feel better. Her appetite improved and bowel movements were less frequent (Fig. 3). She was discharged from the hospital without operation early in August, 1947, and continued to visit the Outpatient Department. Despite her improvement there was little reason to think that it would be sufficiently sustained to lead to recovery. Moreover, her rigid attitudes and difficulty with introspection and communication made it seem unlikely that she would benefit from any therapy short of surgery. Nevertheless, by the latter part of November, 1947, sigmoidoscopic examination showed a normal colon and her symptoms had almost entirely disappeared. At that time she was having one or two loose bowel movements a day, but she passed no blood.

She said that since she had been treated with attention to her life problems and conflicts she felt generally better and more tolerant of her husband's lack of cooperation.

Over the period of the next 12 mo., during which she was visiting the clinic at frequent intervals, her symptomatic improvement was maintained. At the end of this period there were no symptoms of ulcerative colitis and she was having one or two normal bowel movements a day, without blood or mucus. The patient said that she was feeling calm and at peace, relatively relaxed, and better than she had ever felt before the onset of her illness. Her attitude toward her husband and her children was more tolerant. She continued to do her housework as carefully as ever, but did not drive herself as before. Temper outbursts continued, but she brooded much less. Now her general

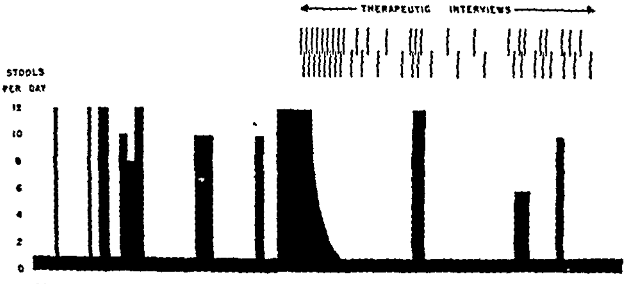

Fig. 2 (case 2).—After the establishment of a good physician-patient relationship through therapeutic interviews, the episodes of acute bloody diarrhea became less frequent and shorter in duration. There was no significant change in environment or attitudes of relatives. Each short line represents one interview.

aspect was more buoyant and cheerful, and her statements of *improvement were more convincing. She was slowly learning to deal with herself, and the prognosis now seemed good.*

During the first year she was free of symptoms, but during the second year of "follow-up" she had transient periods of bloody diarrhea in settings of mounting suppressed anger directed toward her children (Fig. 3).

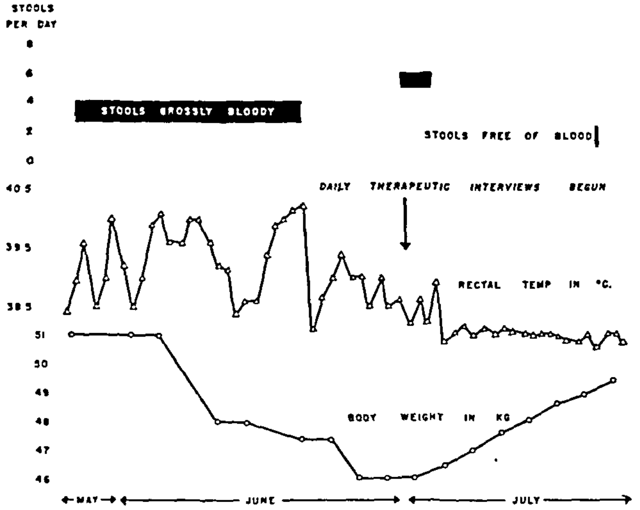

Fig. 3.—This diagram shows the hospital course of the patient described in case 2. After the institution of daily therapeutic interviews, there is a rapid diminution in the diarrhea and a disappearance of blood from the stools. At the same time a defervescence and a rapid gain in weight began.

A radical change in environment for the patient minimized the number of occasions which precipitated intense feelings of hostility. The subsequent calm and security resulting from the altered environment was found to bring about a striking reduction in symptoms without basic personality change. The following protocol describes this phenomenon in a 29-year-old woman in whom ulcerative colitis developed in an intolerable life situation. Major changes in the behavior of her husband and frequent removal of the patient from her environment resulted in feelings of calm and security and a rapid abatement of symptoms (Fig. 4). In three of the 19 patients radical changes in environment were associated with prompt diminution in symptoms.

Case 3.—A 29-year-old white Spanish Jewish woman had ulcerative colitis of three years' duration. She was the youngest child of three. A remarkably overprotected child and adolescent, she was extremely *dependent on her mother for affection and support.* She was married at 19 to a man of her family's choice and immediately transferred her feelings of dependency to him. Her childlike fantasy of a strong, decisive, independent, affectionate and demonstrative male was not fulfilled in her husband. He was a dependent, unaggressive, shy, retiring, undemonstrative man who was devoted to his mother. The mother-in-law, in whose house they lived, disliked and openly criticized the patient in the presence of her husband. The husband made no effort to defend his wife, and the patient, although she became more and more resentful about the situation, said nothing. She remained smiling and cheerful in front of her husband and her family. As time went on she became fond of a brother-in-law who was kind to her, "took my part" and "told the mother-in-law off." She stated that "he was the only friend I ever had." This man died six years after the patient's marriage. Within two days of his death, the patient, in a setting of anxiety, fearfulness, increasing resentment toward her husband and mother-in-law, and in conflict as to whether to go home to her parents or remain in her unpleasant marriage, acquired acute ulcerative colitis. She said, "I felt alone in the world. I had no one to lean on." During the three years of her illness the symptoms were never absent, *although for about four months of each year they were very mild.* Approximately twice each year she had an acute exacerbation of symptoms lasting three to six months. Each episode was invariably precipitated by an argument with her mother-in-law, in which her husband "let her down." Each episode was characterized by conflict (whether to leave the husband or not), fear of losing her husband, anger and resentment toward the husband and his mother, and an inability to express her feelings. Each exacerbation of symptoms ceased when the patient would take a "vacation by myself" or the mother-in-law would spend the winter in Florida. When interviewed for the first time, she weighed 70 lb. (31.8 kg.) and was having a bowel movement almost hourly. Her temperature was 102 F. Sigmoidoscopic examination revealed an engorged, bleeding, ulcerated, friable spastic rectum and lower sigmoid. X-ray examination revealed spasm and shortening and ulceration in the entire large intestine. She was immediately hospitalized, ordered to remain in bed, and given a diet of her own choice. She poured out all of her wrath and indignation to her physician. The latter listened sympathetically and agreed with the patient's interpretation of her problems and supported her in complaints and bitter feelings. She was encouraged to be confident that she would recover and that steps would *be taken to help solve her problems.* On the fourth hospital day she was informed that her mother would come to live with her when she left the hospital and that her father was making plans to provide a vacation for her. She was also told that her husband was being attended by the physician. Within 24 hr. her bowel movements decreased from 10 to three per day and the fever ceased (Fig. 5). She said she felt that the hospital and the physician "were my friends." Except for a mild exacerbation following a visit from her mother-in-law, the improvement persisted. She was discharged in three weeks.

During the year following, the husband had "spoken to" his *mother in the patient's presence,* and the mother-in-law did not "bother" her as much. Her mother remained with her for six weeks. In the following year the patient was seen for 25 one-hour visits, during which time an attempt was made to help her see and understand her behavior and become a more independent, self-sufficient person. At the end of a year and a half she was entirely symptomless for eight months and weighed 104 lb. (47 kg.). Sigmoidoscopic examination revealed no abnormality, and the x-ray findings indicated less spasm and ulceration of *the colon.*

The ability of a patient to participate in a constructive physician-patient relationship was found to be related to the dwindling of symptoms and, inversely, failure to do so was associated with persistence of colitis. The following protocol describes a 36-year-old woman who had ulcerative colitis for three years. She was able to discuss only certain less troublesome facets of her personal problems. She changed her behavior but little. The symptoms diminished slightly, but she had episodes of bloody diarrhea of about the same frequency and severity as

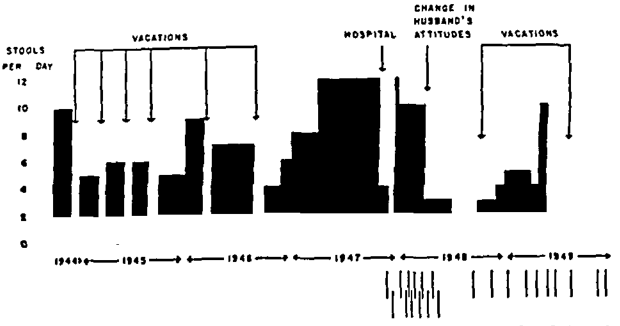

Fig. 4 (case 3).—Periods of removal of the patient from her environment corresponded with periods of freedom of symptoms. A radical change in environment or in the attitudes of relatives is often adequate to remove *the occasions of anger and hostility and to diminish* 'symptoms.

before the interviews were begun. Six patients of the 19 were unable to participate fully in the therapeutic relationship. Of these, four showed no change in symptoms and two improved only slightly.

Case 4.—A woman, aged 35, had mild symptoms of ulcerative colitis continuously for three years, having four to six bloody rectal discharges a day. She was an exceptionally rigid, compulsive person. Indecisiveness, dependency, and inability to ventilate or act out aggressive feelings, and a vicious temper were the outstanding personality features. She said "If I didn't have such a bad temper, I wouldn't have this disease." Ulcerative colitis began in a setting of increasing anxiety over caring for a newborn infant, conflict and resentment toward her mother-in-law who had moved into her home, and increasing anxiety and resentment over being unable to procure a sufficient variety of foods during the war even though she shopped for at least four hours every day. Sigmoidoscopic and x-ray examinations revealed moderate structural changes indicative of ulcerative colitis in the rectum and sigmoid area. Repeated examinations of the stools were negative for pathogenic organisms.

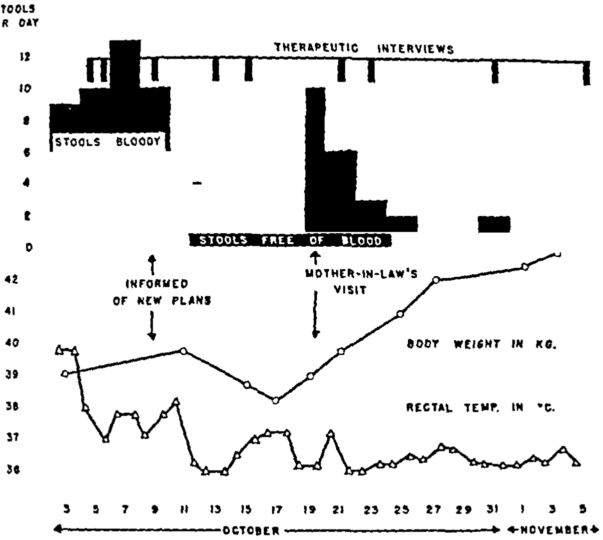

Fig. 5 (case 3).—Rapid decrease in diarrhea, fall in temperature, and weight gain following the presentation to the patient of a plan for a solution of her problems. There was a mild exacerbation during and following humiliation associated with a visit from her mother-in-law.

She has been interviewed for a total of 22 hr. over a year and a half. Although there was some improvement, she continues to have episodes of acute bloody diarrhea. Each of these exacerbations has been precipitated by situations which place her as the center of responsibility in dealing with a sick child or an irate mother-in-law. At such times she gets little or no help from her husband, who withdraws from the scene.

The patient has not taken full advantage of all of the potentialities of the therapeutic relationship and has made only feeble attempts to understand and to help herself. There are still many facets of her life which she refuses to discuss. The slight improvement which has been seen is probably attributable to the improvement in the environment; that is, the child has grown older and is less difficult to deal with, and, the war being over, shopping is easier.

When the patient was unable to give up an unworkable behavior pattern and an excessively costly set of values the clinical course was protracted. This phenomenon was seen in two patients. The protocol of one of these is given below (Fig. 6).

Case 5.—A 20-year-old white man had been ill with ulcerative colitis for one year and usually had eight to 10 bloody bowel movements per day. He was a tall youth, had a large skeletal frame, and was heavily muscled. Except for clubbing of the fingers and toes and a small perirectal abscess, the physical examination was unremarkable. X-ray pictures taken after barium enema showed narrowing and spasticity of the descending and sigmoid colon. In addition, there was extensive destruction of the mucus membrane and ulceration in this same area. There was a constant narrowing of the sigmoid colon. Sigmoidoscopic examination revealed marked hyperemia, engorgement and fragility. There were numerous petechial lesions and tiny shallow ulcerations throughout the rectum. Intense spasm at the rectosigmoid region prevented further passage of the instrument. Repeated examinations of the stools failed to reveal pathogenic organisms.

The patient was the first of two children of American-born Catholic parents of Irish stock. His mother was overprotective and oversolicitous but had little ability to demonstrate feelings of warmth and affection toward her children. She was the dominant figure in the household, made the important decisions, and handled the money. She repeatedly indicated that her husband was a poor provider and hinted that she expected help from her sons as they grew older. After the patient's illness began, she prepared his meals, rigidly adhering to a prescribed diet, spending extra money for special foods and berating him when he did not eat them.

The patient's father, a laborer, was described as "easy-going," "nothing bothers him," "doesn't care about anything." He had no particular hobbies or interests and was content to "sit around the house and do nothing."

The patient's brother was "easy-going" like the father. The patient looked on both the father and brother with scorn.

Because of "feeding difficulties" and vomiting in infancy and because the mother was working to supplement the family income, the patient spent most of his first year of life in a Catholic orphanage. After this he lived at home. Except for the common diseases of childhood, he was healthy until his first and second years of grammar school, when he suffered from many attacks of vomiting and lost so much time from school he had to repeat a year. These years corresponded to his brother's first and second years of life. The patient did poorly all through grammar school and played "hookey" frequently. He was an angry child, known to be "bad-tempered" and engaged in many street fights. Although he never "picked a fight," he had a "chip on his shoulder" and never avoided a fight. He was known as a "rowdy" and troublemaker in the neighborhood, and most of the children were afraid of him because he frequently struck them. He got along poorly with his younger brother, considered him a "nuisance" and a "pest," and would often strike him. He was "very close" to his mother and saved most of his spending money to buy her presents.

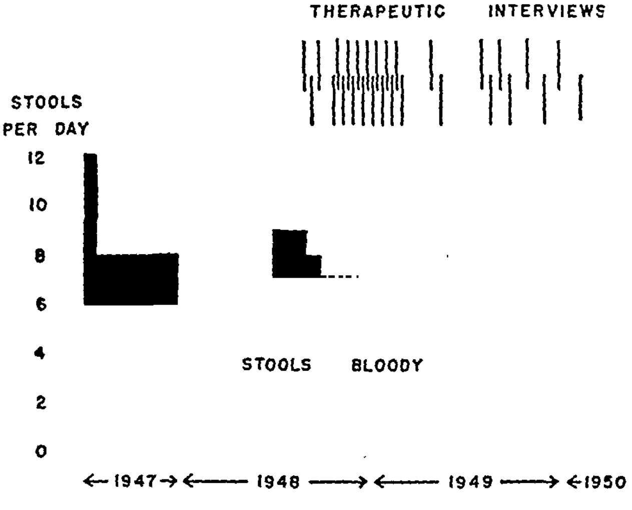

Fig. 6 (case 5).—Severe symptoms continue in this 20-year-old man, who was unable to utilize his understanding of himself in altering his behavior. The inability to alter one's behavior or to give up an unworkable set of values is associated with a protracted course.

The brother, when going to school, was a "good boy," obedient and quiet, receiving good grades. The family prodded the patient with these facts and "teased" him, indicating that his brother might "pass" him in school. He was frequently told that he should be "more like his brother." The patient said he wanted people to like him, but he was always getting into fights and into various kinds of trouble for breaking windows and for street-fighting. Once, a boy who had been "beaten up" by the patient struck his head on a curbstone and "almost died." Toward the end of his grammar school experience and the first year of high school, a change took place in the patient. He stopped fistfighting and began to try to win approval from his parents and his friends by "being nice." He attributed this change to being afraid of hurting someone while fighting, or latterly, of getting hurt himself. He began to study hard in school to "beat his brother" and to "make up" the year of lost school work. He took a job after school hours to "make money" to buy things for the house and for his mother.

In his third year of high school he pushed himself exceptionally hard in order "to make the four year course in three and one-half years." He resented his school work, felt that it was "wasted time," "gets me nowhere" and only put off the time when he could get a "steady job." He "hated it," yet he forced himself to do the school work. At the same time his part-time job continued. He saved enough money to buy an electric refrigerator for his mother. She accepted this gift "as a matter of course," thanked him for it, but did not extend the amount of gratitude and affection he anticipated. His father barely noticed it. He became bitterly resentful toward them, but said nothing. A short time later he was to take his final school examinations. In this setting of increasing anxiety, anger, and resentment toward his family over the humiliating gift episode, and his failure to win overt manifestations of their approval, he began to notice loose, watery diarrhea, which in a few weeks became bloody. In spite of this illness he finished his high-school work, graduated as he had planned at the end of three and one-half years, and went to work as an assistant printer. During the ensuing year his symptoms continued, the patient having eight to 10 loose watery bowel movements, usually containing blood and mucus. After a slight exacerbation of his complaints and the development of a perirectal abscess, he was admitted to the hospital for study.

He was usually smiling and pleasant. He said that he never showed his feelings, saying "People don't like you if you're mean." Although he was aware of a strong quick temper, he never allowed it to show itself, covering it up with smiling. He likewise had difficulty in showing feelings of love and warmth. "Little things," such as losing a bowling match, or being "out smarted" by his companions in an exchange of "wisecracks," would precipitate rage in him. He saved his money meticulously so he could buy his mother more gifts, and, indeed, purchased a new rug and kitchen flooring the following year. He wanted to be "top man" in anything he did. He felt that he had to be the best in bowling, baseball, earning capacity, money saved, and "fancy" clothes. If one of his friends said he had slept for twelve hours, the patient would "top" him by saying he had slept for thirteen hours. When defeated in bowling, he would be angry and "sulk" for hours. In spite of this competitive feeling he was not a leader in his group. He did "anything the rest were going to do." He avoided any circumstances which might put him in an embarrassing or humiliating situation. Although he wanted to learn to drive an automobile, he never accepted his friend's offer to teach him as he felt the friend would "laugh at him" while he was learning. The patient was fastidious about his personal belongings. "Anything out of place drove me mad." He had a strong drive to have possession of "things." He wanted "clothes," a television set, a car, and a bank account. "Everything I saw I wanted." He wanted to work seven days per week, so he could earn more money. Weekends he felt were a waste of time. Although he was friendly and affable at his work, he was "grouchy" and "unstable" at home. His mother said he was always "crabbing" about something. If the food displeased him, he refused to eat it. He always seemed to "get up on the wrong side of the bed." Fear of displeasing others or of being "criticized" haunted him continuously.

He denied masturbation and had very few "dates," and these only when the whole "gang" went out. Girls were a "waste of time" and only made you "spend your money." Money and a bank account represented the only kind of security he knew. He wished never to "be like my old man, without a dime." He desired to earn enough money before he was 30 so that he could "retire." For a time he entertained the idea of taking a civil service job which didn't pay much but had a good pension.

This young man was interviewed for a total of 26 hr. over one year's time, during which period he worked daily. No medication was given except small amounts of ferrous sulfate, vitamin supplement and 30 mg. of phenobarbital sodium daily. The interviews revealed that he was aware that anger and anxiety were associated with exacerbations of his symptoms. He knew he was more prone to anger and was much more "sensitive" than his fellows. His competitive attitudes toward associates were linked by him to his attitudes toward his brother and father. He was unable to utilize this information in altering his daily behavior. As he said, he did "the same things over and over again." He experienced the same humiliations and frustrations in dealing with his acquaintances, and in his work. The diarrhea, consisting of 8 to 10 bowel movements a day, continued as did the passage of blood. The x-ray and sigmoidoscopic pictures did not change.

COMMENT

Comparison of this unselected group of patients with other series of patients with ulcerative colitis shows essentially the same sex and age group distribution.[11] Thorough diagnostic procedures on all the patients were carried out by us, and at other hospitals, to verify the diagnosis of chronic, nonspecific ulcerative colitis. The course of the disease prior to the institution of our therapy was entirely compatible with such a diagnosis. In each patient the onset of the disease and each of its exacerbations coincided with periods of stressful life circumstances.

The patients were extremely dependent on the approval of others. They were uneasy and anxious in the presence of angry individuals and demanded an unending show of love and affection from their parents and spouses. They needed to be "nice to everyone," and to be on good terms with everyone; otherwise they became anxious and tense. They "did things they didn't want to do" in order to placate and to keep the peace. These peace-making attitudes made it appear that these were persons of even-temper and serenity, a misconception sometimes reinforced by a "beatific" or "angelic" look.

The overdependence, the inability to tolerate hostility in others, or to express or to act out their own hostility, the inability to make decisions, the passivity, the ever-present fear of losing the good opinion of others, made for ever-increasing conflict. In the face of such a combination of oversensitivity, passivity, indecisiveness, dependency, and hostility it was extremely difficult for any one of them ever to satisfy his dreams, desires and ambitions. Hence, they were frequently frustrated and humiliated, which made them react with anger and resentfulness. The conflict arising from desire to act out or verbalize their hostility and fear of the consequences of such action precipitated in them anxiety and an exacerbation of symptoms. In brief, the patients were hostile but "sweet," anxious but "calm," timid yet rebellious. They had aggressive fantasies, but their behavior was passive.

They experienced strong feelings of guilt over their hostility, and often felt unworthy of others' love because of their anger and resentment. The guilt was felt most often in relation to either their parents or spouses. This guilt, making them feel unworthy, also made them fear the loss of the love of the person involved and made for more anxiety.

A series of features have been indicated which determine the prognosis, and have little or nothing to do with the age of the patient, the duration of the disease, or its extent. For example, case 1 was older, and had been ill for a greater length of time than case 5, yet the younger patient followed a protracted clinical course without improvement.

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[11] Bargen.[1a] Bockus.[6]

Prugh [12] has shown that recovery has occurred in children with ulcerative colitis when they were able to display overtly aggressive behavior. In our own patients, when it was possible, such expressiveness appeared to have a salutary effect. In any case, it seems clear that satisfactory treatment of this disorder requires detailed attention to the patient's total life adjustment.

Measures, such as careful and meticulous attention to complaints, frequent examinations, diet regulation, institution of new medications, and a solicitous attitude on the part of the physician, are frequently effective in alleviating symptoms. Such measures are probably effective only inasmuch as they establish a good physician-patient relationship.

Comparison of the results of treatment in this series of patients with previously reported series,[13] indicates that the method used here is as effective as other methods. This suggests that the therapeutic factors operating in other reported series are similar to those described in this study.

SUMMARY AND CONCLUSIONS

A series of 19 unselected patients with chronic ulcerative colitis has been presented and compared with similar series in the literature in regard to therapeutic results. Eleven patients were considerably improved, two slightly improved, and six were unimproved.

Ulcerative colitis was viewed as a stress disorder. A variety of therapeutic measures designed to alleviate this stress were used and found to be effective in approximately the same proportion of patients reported by others, using ostensibly different methods. This suggests that the therapeutic factors operating in other reported series are similar to those described in this study.

A constructive physician-patient relationship was of the greatest benefit to the patient, and favorable results in treatment were not obtained without it.

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JAUNDICE IN ACUTE SUBLEUKEMIC LYMPHOCYTIC LEUKEMIA DUE TO OBSTRUCTION OF THE COMMON DUCT BY PORTAL NODES

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The object of this report is to call attention to a case of severe jaundice that resulted from an unusual obstruction of the common bile duct by enlarged portal lymph nodes. Jaundice due to obstruction of the common bile duct by portal lymph nodes has been frequently mentioned but seldom seen.

REPORT OF A CASE

A white truck driver, 29, was admitted on April 12, 1950, complaining of a swelling in the right side of the neck for 10 days. He was in excellent health until three months prior to admission, at which time there was gradual onset of pain in the chest and back. This was described as a constant, dull, aching pain across the anterior part of the right side of the chest and a constant, dull, aching pain in the right lumbar region. The pain was not aggravated by respiration or motion. He had general malaise, lassitude, and anorexia and had lost 15 pounds. In spite of this symptomatology, he continued working. Two months prior to admission a cough developed which occurred in severe paroxysms. He raised about one-half cup of mucoid sputum daily. Ten days prior to admission a throbbing developed in the right side of the neck. This persisted; then five days prior to admission, he felt a rather severe pain radiating down the posterior aspect of the right arm.

On admission, physical examination revealed a well-developed, well-nourished, robust, white man who did not appear to be acutely or chronically ill. The right anterior cervical nodes were enlarged and palpable, these being hard and matted together. The complete mass of nodes was 8 cm. in diameter and protruded 2 cm. externally. The skin over this area was tight, and there was slight tenderness on deep pressure over this area. The pharynx was moderately injected. By percussion, it was thought that the diaphragm was immobile on the right side, and this was confirmed by fluoroscopy. The percussion note was flat over the right base, and the breath sounds were absent. Tactile and vocal fremitus were impaired at the right base. There was a pronounced sensation of fulness on palpation of the right side of the abdomen; however, the liver edge could not be felt.

The red blood count on admission was 4,1500,000 with hemoglobin of 15 gm. The white blood count was 7,950 with 50% neutrophils, 49% lymphocytes, and 1% monocytes. In a subsequent differential the pathologist identified some of the cells of the lymphocytic series as being lymphoblasts. Subsequent differential counts showed a steady increase from 36% lymphoblasts to 100% lymphoblasts in the terminal stage. The red cell count dropped from 4,150,000 to 3,139,000 with hemoglobin of 10 gm. On four different occasions, fluid was removed from the right pleural cavity, the quantity varying from 500 cc. to 2,500 cc. The pleural fluid had a specific gravity of 1.017 with a white cell count of 12,000, 75% of these being polymorphonuclear leucocytes and 25% of these being lymphocytes; some of the latter were lymphoblasts. The total protein of the pleural fluid was 3.43 gm. The sternal bone marrow was hypercellular with 88% prolymphocytes. Roentgenograms of the chest showed a large homogenous mediastinal mass and pleural effusion on the right.

Shortly after admission, what appeared to be a superior vena cava syndrome developed. He became cyanotic, and the vessels of the neck became engorged. There was pitting edema of the chest anteriorly, and the superficial vessels of the upper abdomen and the lower chest wall became dilated. The venous pressure was 32 cm. of water, and the circulation time was 17 seconds with the use of magnesium sulfate. During hospitalization, he maintained a temperature of 101 to 102 F. and had a daily peak of 103 to 104 F. The bone marrow studies confirmed the diagnosis of acute subleukemic lymphocytic leukemia. With the realization that it would have no beneficial effect on the disease, but in an attempt to relieve the distressing symptoms of the superior vena cava syndrome, roentgen therapy was begun, 50 r

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and 100 r being applied to the anterior midchest on two successive days. This was discontinued in view of the rapidly progressive disease and the lowering of the white blood count. The superior vena cava syndrome progressed rapidly. He coughed almost constantly and was dyspneic at all times. The second day after roentgen therapy, the white blood count dropped to 3,000 with 95% lymphoblasts and then gradually decreased until on the day of death the white blood count was 1,000 with 95% lymphoblasts. One week before death, he suddenly became jaundiced. The serum bilirubin was 3.75 mg. per 100 cc. as contrasted to serum bilirubin of 0.9 mg. per 100 cc. at the time of admission. He became severely jaundiced with reddish brown urine and acholic stools. Cephalin flocculation was 4+. Two days before death he showed a distinct bleeding tendency in the gums and nasal mucosa. He died 35 days after admission.

At post-mortem examination the right thoracic cavity contained 200 cc. of clear yellow fluid. The right lung was completely collapsed and airless. The edge of the liver extended to the level of the iliac crest. The left lung weighed 650 gm., and increased resistance was offered to the cutting edge. The cut surface had a smooth yellowish appearance. The consistency was less spongy and alveolar markings were less pronounced than normal. The right lung weighed 650 gm. It was compressed and airless. The anterior angle of the lung was thickened and cord-like. This entire lung was completely atelectatic. There was infiltration by a yellowish, thick, firm, homogenous material extending around the entire periphery of the compressed lung, making it almost unrecognizable as being lung tissue (figure). This homogenous material covered the entire pleural surface of the right lung. Some of this cord-like material was nodular in character. The spleen weighed 200 gm., and macroscopic examination showed no significant abnormalities. The liver was firm, swollen, and enlarged. It weighed 3,100 gm. The cut surface was homogenous with the central vein area being slightly more pronounced. A perilobular infiltration of this yellow firm material could be seen, giving the entire cut surface a yellowish color. There was tremendous dilatation of the common duct in the proximal two-thirds. The diameter of this saccular dilatation was 2 cm., and the thumb could be placed within the lumen. In the lower third portion the common duct was completely occluded by pressure from adjacent, large, firm, yellow, portal nodes. Between the nodes, there was a yellow, firm infiltrate. Extreme pressure on the gallbladder would not cause bile to flow from the common duct to the duodenum. After the dilated common duct was opened, pressure on the gallbladder caused white inspissated bile to exude from the cystic duct into the common duct. The kidneys were swollen, weighing 250 gm. (left) and 200 gm. (right). The capsule was stripped with ease, and the surface was smooth. Numerous nodes were in the mesentery, which was extremely thickened. A yellow, firm, hard, infiltrate permeated the mesentery.

Photograph showing large bronchial nodes and adjacent leukemic infiltrate.

On microscopic section, the left lung had alveoli which were thickened by a cellular infiltrate varying in extent from area to area. The cells were large and round with pale vascular nuclei resembling those seen in section through the lymph nodes and various areas of cellular infiltration. Numerous areas of hemorrhagic extravasation were present where the alveoli were completely filled with red cells. Microscopic section through the right lung could hardly be identified as lung tissue. In some areas, however, the alveoli were compressed, having lost their lumina. In most areas the tissue was unrecognizable, being composed of a mass of cells, chiefly large mononuclears, which had a very small amount of cytoplasm, large vesicular nuclei, very heavy chromatin networks, clear-cut nuclear membrane, and occasionally large nucleoli. Numerous red cells were interspersed among the white cells, and mature lymphocytes were present in small numbers. The bronchioles were compressed and had virtually lost their lumina.

The pericardium showed very sparse, although in some cases more focal and pronounced, infiltrate of cells resembling those described in the lung.

The hematopoietic elements in the marrow were virtually replaced by a single type of cell, a large lymphocyte similar to those previously described. Small lymphocytes were present also, and there was a sprinkling of red cells between them. The cells were not closely packed. The blood sinuses were virtually empty, only a few red and white cell precursors being seen. This implied failure of delivery of the white cells into circulation and explained the paucity of cells in the peripheral blood.

The lymph node structures were completely obliterated by a mass of large mononuclears, similar to those previously described in the lungs. Some of the nuclei, however, were not completely round but were somewhat bizarre or spindle shaped. Numerous areas of hemorrhagic extravasation were present. A thin fibrous reticulum could be seen ramifying among groups of cells. There was little or no involvement of the spleen by leukemic cells which were to be seen only in the blood vessels. The splenic pulp itself appeared normal except for dilated sinusoids, and the architecture was not obliterated. The malpighian corpuscles were fairly normal in size and number. In the small intestines in certain areas the villi were necrotic, and the mucosa and submucosa were richly infiltrated with a dense mass of lymphocytes. These were mainly small lymphocytes and did not appear to be of the lymphoblastic type seen in other organs and in the infiltrated areas. The extent, however, was much greater than that observed in Peyer's patches. There were no significant abnormalities seen in the kidneys except for several areas of interstitial infiltration with cells resembling those previously described, these being just under the renal capsule.

COMMENT

Obstruction of the common bile duct by enlarged portal nodes is uncommon. When it does occur, it is nearly always caused by tuberculosis, Hodgkin's disease, or lymphadenitis.[1] Obstructive jaundice due to enlarged portal lymph nodes caused by leukemia is extremely rare.[2]

SUMMARY

A case of acute subleukemic leukemia is presented which shows several interesting and unusual features: (1) leukemia with a normal white cell count at admission; (2) leukopenia during nearly all the hospital course; (3) superior vena cava syndrome, and (4) jaundice due to obstruction of the common bile duct by enlarged portal nodes, with tremendous dilatation of the common duct.

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PULMONARY CHANGES FOLLOWING CHOLECYSTECTOMY

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The incidence of pulmonary complications following abdominal surgery has long been a matter of concern to the physician and patient. Although scores of manuscripts have been written about various phases of the subject, no single work was found which described the clinical and roentgenologic changes following cholecystectomy. It was our impression that these were of sufficient significance to warrant investigation. This study was thus undertaken with a hope of obtaining data which might be of practical importance.

A review of the related literature over a period of 20 years was undertaken. It revealed certain pertinent information. In an analysis of 23,000 general surgical cases, Eliason and McLaughlin [1] reported an incidence of 1.38% of postoperative pulmonary complications. Taylor and his co-workers [2] reported 1.2% of lung abnormalities in a series of 12,349 cases. King [3] in 1933 stated that between 35 and 46% of patients undergoing surgery of the stomach, duodenum, and biliary tract showed signs of bronchitis, pneumonitis, and atelectasis. That same year Prinzmetal and others [4] stressed the importance of pulmonary subventilation after surgery in the upper abdomen and discussed the mechanisms involved. Faulconer and his associates [5] found that in about 8% of patients having operations on the upper urinary tract, atelectasis developed in the contralateral lung. They felt that this was owing to the lateral position the patient assumed during operation. It was their impression, also, that the method of anesthesia did not materially affect the end results. Stringer,[6] in a series of 55 patients on whom partial gastrectomy had been done, noted that 26 showed abnormal postoperative roentgenologic signs. Of the latter number, 13 had signs of lobular, partial, or massive atelectasis. He x-rayed these individuals in the supine position immediately, four, and 24 hr. after operation. No signs were noted in the immediate postoperative films, but roentgenologic changes appeared in some in four hours and in others in 24 hr. Other pathological changes noted were interpreted as bronchopneumonia, bronchitis, and collapse with effusion.

Recently, two significant works on this general subject made their appearance. In the first, Dripps and Deming [7] reported the rate of occurrence of postoperative atelectasis and pneumonia in two series of cases in which upper abdominal operations had been performed. In the earlier group of 250 patients they found the incidence to be 11% for subjects receiving inhalation anesthesia and only 4.2% in those given spinal anesthesia. The later group consisted of 900 patients. These were subjected to all precautions in order to avoid postoperative pulmonary complications. The incidence in those given spinal anesthesia remained essentially unchanged, whereas after inhalation anesthesia the rate decreased to 4.1%. The use of narcotics was kept to a minimum; codeine was used for the relief of pain; the use of abdominal binders was avoided, and small amounts of adhesive and light gauze dressings were used. Other precautionary measures included early mobilization, suction of the nasopharynx, and prophylactic antibiotics. Local nerve blocks were employed to relieve pain and allow for greater respiratory movements. They concluded that, unless a meticulous and comprehensive preventative program was followed, regional and spinal anesthesia are preferable from the standpoint of pulmonary complications.

The second paper, by Swank and Smedal,[8] presented a study of pulmonary atelectasis in stuporous states. They observed pulmonary atelectasis, bronchopneumonia, and related phenomena during continuous deep amobarbital (amytal®) sodium narcosis in young soldiers and found the incidence to be as high as 65%. They x-rayed the chests in the supine position and found that the lesions disappeared within from a few to 24 hr. Aside from the temporary nature of the roentgenologic changes, they felt that these changes could easily have been confused with atypical pneumonia.

MATERIAL AND METHOD

The clinical material consisted of 40 consecutive patients who were to have cholecystectomies only. These individuals were drawn from the ward and private services of six different surgeons and included several age groups. All roentgenograms of the chest were taken with the patients in the upright position and at a target distance of 2 m. The technique was standardized so that films of comparable densities were obtained. The roentgenograms were taken within 24 hr. before operation, on aproximately the fourth postoperative day, and at the time of the patient's discharge from the hospital. In addition to the x-ray studies, certain other pertinent data were recorded. These included the patients' age and sex, type of habitus, history of previous pulmonary infections, methods of anesthesia, and duration of operation. The clinical course and degree of ambulation in the postoperative period were especially noted.

From the Department of Medicine, Roentgenology and Surgery, Yonkers General Hospital; Attending Physician (Dr. Rudnikoff) and Director of Roentgenology (Dr. Headland). Several members of the surgical staff cooperated in this study.

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FINDINGS

Of the 40 patients included, 30 were women and 10 were men. Of these, 37 received a combination of nitrous oxide, ether, and oxygen, with or without thiopental (pentothal[s]) sodium for induction; and three were given spinal anesthesia. The time for operation varied from 35 min. to three hours, with an average of one hour and 10 min. All patients were taken out of bed between the second and sixth postoperative day, the mean here being 3½ days. Discharge from the hospital usually took place between the eighth and 12th days.

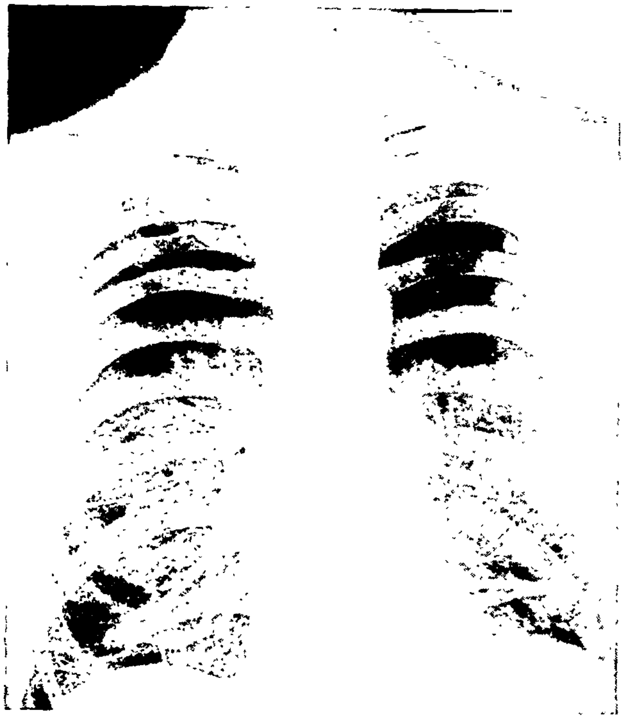

Fig. 1.—Illustration of platelike atelectasis.

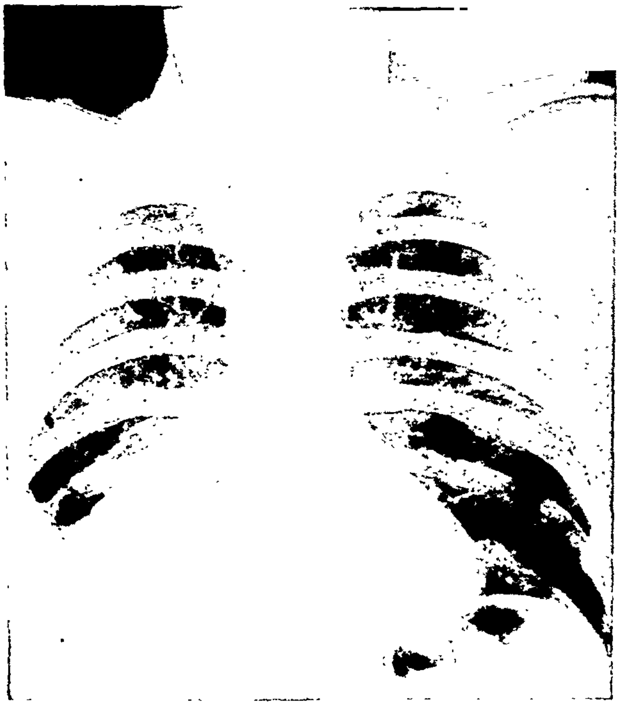

Fig. 2.—Illustration of extensive atelectasis.

Roentgenograms of the chest before operation were normal in all the 40 patients. On the fourth postoperative day, 28 of these, or 70%, showed changes, not previously present, in the roentgen appearances. These were interpreted as platelike atelectases, patchy or extensive atelectases, or bronchopneumonias. These three types are illustrated in Figures 1, 2, and 3. It was further noted that the lesions occurred bilaterally and either on the right or left side. The former predominated in a ratio of 3 to 2.

Although 28 patients showed deviations from the normal in their postoperative x-rays, 10 (37%) of these (or 25% of the entire series) exhibited symptoms and signs of sufficient clinical significance to require additional treatment. The importance of the roentgenograms at the time of discharge was demonstrated adequately when such observations revealed that seven patients showed residual atelectases or pulmonary infiltrations on the day they left the hospital. The only death resulted from massive pulmonary embolism. An analysis and summary of these data are presented in the table. The relationship of sex to incidence is not shown because seven of 10 male patients and 21 of 30 female patients (both 70%) showed postoperative roentgenologic changes in the lungs.

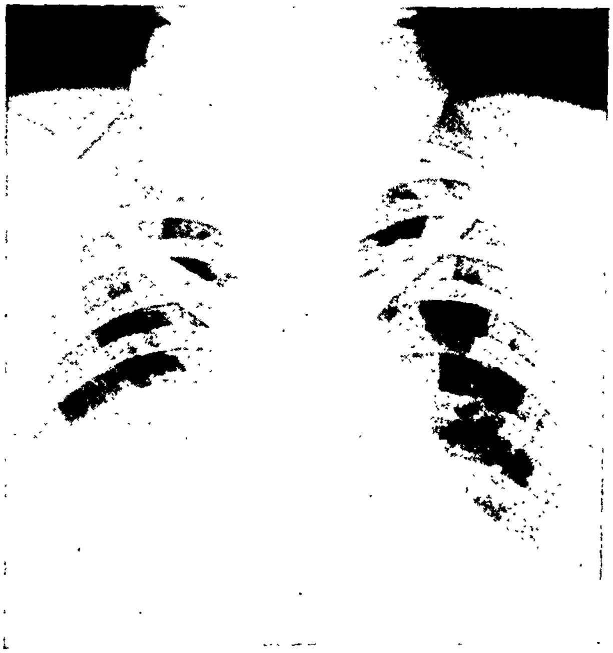

Fig. 3.—Illustration of pneumonic infiltrations.

COMMENT

It is difficult and at times hazardous to evaluate and interpret changes which occur in roentgenograms of the chest taken after operation. The importance of the postoperative interval in relation to pulmonary findings cannot be overemphasized. It has been our impression and experience that almost 90% of patients undergoing surgery in the upper abdomen will exhibit pulmonary signs in the first 24 hr. following the operation. Physical findings during this period include diminished breath sounds at the lung bases, elevated diaphragms, and showers of moist, crepitant, and sonorous rales. Roentgenograms taken during this time usually reveal diminished aeration of the bases of the lungs, symmetrical or asymmetrical elevation of the diaphragms, and atelectasis. Many of these findings are transitory and tend to disappear within the first 24 hr. For these reasons, the authors felt that every effort should be made to eliminate these purely evanescent manifestations. In this way, the lesions which appeared in the lungs would have greater clinical significance. It was felt that this could be accomplished by avoiding the use of roentgenograms made in the supine position or by portable x-ray apparatus, and by delaying such studies until the fourth postoperative day and at the time of discharge.

The various types of lesions which were observed in either or both lungs roentgenographically were, at times, difficult to interpret with accuracy. Some suggested bronchopneumonia; others, different degrees of atelectasis. This situation served again to emphasize the great need for a standard nomenclature in reference to the roentgenologic interpretation of atelectasis and pneumonia. The frequent appearance of linear shadows at the bases of the lungs were of considerable interest. These platelike or disklike atelectases were first described by Fleischner in 1936.[9] He attributed them to restrictions in respiratory excursions and plugging of the smaller bronchiolar radicles with tenacious mucus. He noted their occurrence during and after upper abdominal disease or operations, in contusions of the chest wall, and in other states in which motions of the thoracic cage were interfered with. Actually such areas of atelectasis are the result of physical and mechanical phenomena.

TABLE 1.—*Analysis of Data*

Age Groups	No. of Cases	Positive Post-operative X-Rays	Significant Pulmonary Morbidity	Residual Lung Findings at Discharge
10-19	1	1	..	..
20-29	2	1	..	..
30-39	3	2	..	..
40-49	10	4	2	2
50-59	15	12	6	4
60-69	7	6	2	1
70-79	2	2	..	..
Total	40	28 * or 70%	10	7

* Sixteen patients had bronchopneumonia, and 17 had atelectasis (five had both).

There has been a tendency on the part of some roentgenologists to minimize the importance of platelike atelectases and to suggest that they have little clinical significance. Other authors,[10] however, have emphasized their significance not only because they may be a source of spreading atelectasis but also because of the possibility of superimposed complicating infections in such areas. At least one case [11] was recorded wherein the diagnosis of platelike atelectasis was made, which subsequently proved to be linear metastases. Further emphasis on the latter point of view was made by Fleischner, Hampton, and Castleman.[12] They described these and other lesions in a thorough study correlating roentgenographic and microscopic findings. In discussing the differential diagnoses of linear and band-shaped shadows in the lungs, they included interlobar pleurisy, atelectases, healed infarcts, and scarring from old destructive lesions. It was their opinion that many of these are so similar in appearance as to prevent differentiation by the roentgenologist.

Our studies have indicated that the incidence of pulmonary complications as seen roentgenographically after cholecystectomy, and probably other operations in the upper abdomen, is higher than has previously been reported in the literature. The presence of residual abnormalities in the lung roentgenograms in a moderate number of patients at the time of discharge is, we believe, of considerable significance. It would be of interest to study a large series of such postoperative cases in this respect. It might offer some explanation for the prolonged period of debility in some persons.

While it is difficult to translate roentgenologic findings into clinical syndromes, it must be stressed that as long as abnormalities are found in the postoperative chest roentgenograms, potential sources of spreading atelectasis and superimposed infections exist. It is of considerable importance, therefore, to exercise every meticulous precaution during the postoperative period. It is desirable to avoid excessive sedation and narcosis before and after operation. Restrictive dressings and covers serve only to interfere with the normal excursions of the chest wall. Dehydration, because it causes bronchial secretions to become thicker and more tenacious, must be overcome quickly. Finally, the need for early mobilization whenever possible must be recognized.

SUMMARY

The postoperative pulmonary findings in 40 consecutive patients undergoing cholecystectomy are presented. The clinical and roentgenologic implications are discussed, and the relevant literature is reviewed.

27 Ludlow St.

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Significance of Personal Problems.—There are two sides to the doctor-patient relationship. Not only must the patient feel confident of the doctor's desire and ability to help him, but the doctor must feel a sincere interest in the patient as a person and in his problems. This interest must be sufficiently deep to be sustained over long periods and to create a determination to see the patient through his troubles without passing judgment or feeling resentment in regard to behavior involving ethical or moral questions, and without being disturbed by unattractive traits of personality.—G. Canby Robinson, M.D., The Significance of Personal Problems in the Understanding and Treatment of Illness, *Bull. Johns Hopkins Hosp.* April, 1951.

ANTICOAGULANTS IN ACUTE FROSTBITE

Frank V. Theis, M.D., William R. O'Connor, M.D.
and
Frederick J. Wahl, M.D., Chicago

The treatment of acute frostbite has been advanced greatly by experimental investigations[1] on the pathologic physiology of this injury during the last war. This work was stimulated by the frequent occurrence of frostbite in the armed forces[2] and the unsatisfactory results of the accepted forms of treatment. Lange,[3] Friedman,[4] and Shumacker[5] then demonstrated experimentally that anticoagulants in acute frostbite prevented development of thrombosis and gangrene. In civilian practice the occurrence of frostbite is, as a rule, uncommon, so that series of clinical results with the use of anticoagulants have not been reported. However at the Cook County Hospital in Chicago, 30 patients with frostbite were admitted and treated during the winters of 1949 and 1950; 14 of them had acute frostbite and were treated with effective anticoagulant therapy, in addition to the treatment previously used. The purpose of this report is to present the results of such treatment.

SELECTION OF CASES

Of the 30 patients with severe frostbite who required admission to the hospital during the winters of 1949 and 1950, only 14 who were exposed to the cold within 16 hours before treatment was initiated were treated with anticoagulants. The average duration of exposure was 10 hours. When the exposure occurred days or weeks prior to admission and gangrene or necrosis of tissue was already present, it was obvious that anticoagulants would be of no value. At the time of exposure, the temperature ranged from 5 to 20 F. However, the severity of the frostbite is dependent not only on the temperature, duration, and type of exposure to cold, but also on the wind velocity, the humidity, and the general condition, age, and individual susceptibility of the patient to cold. The duration of exposure was difficult to ascertain when patients had been found lying on the sidewalk, frequently in an alcoholic stupor and unable to recall the immediate past events. One patient had been shoveling coal without gloves for seven hours. All the patients were men, and the average age was 54, their ages varying from 35 to 80.

As usual, the extremities are affected to the greatest extent; in order of frequency, the hands, feet, face, and in two cases all four extremities were severely involved. These latter two patients, on admission, were in profound shock with unobtainable blood pressure and pulse. Paralysis or paresis of the toes were noted in three cases, of the fingers in two cases, and three other patients complained of paresthesias and hypesthesia.

METHODS OF TREATMENT

Anticoagulant therapy was started within one to two hours after admission. Fifty milligrams of heparin sodium was given intravenously as soon as possible and was given every four hours for 36 to 48 hours. The clotting time was determined by the two tube modification of the Lee-White method. In addition, all patients were given 200 to 300 mg. of bishydroxycoumarin (dicumarol®) as soon as they were able to swallow. Daily prothrombin levels determined the subsequent doses of bishydroxycoumarin. Attempts were made to maintain an effective prothrombin level of 10 to 20% of normal; the usual duration of treatment was 10 days. Later it was felt that heparin sodium should be given every three hours to maintain a prolonged clotting time above twice the normal level.

The routine treatment employed previously was continued in this series of cases so that the beneficial effects of the anticoagulant therapy might be permitted. This included bilateral lumbar paravertebral blocks on four patients early in the series, but later these were discontinued because of the hazard of deep needle punctures in the presence of anticoagulant therapy. One patient received tetraethylammonium chloride. Blood and plasma transfusions were necessary in four patients to combat shock. Local treatment of the affected extremities consisted of gentle cleansing with soap and water, alcohol, and the application of sterile dry or petrolatum gauze pressure dressings. Thawing was done at room temperature (no additional heat and no cooling). Penicillin was given to all patients to combat infection. The principles for treatment of acute frostbite are as follows:

1. TO PREVENT SHOCK

    Watch blood pressure, blood counts, proteins, and hematocrit.

    Give blood or plasma transfusion, as indicated or available.

    Pressure bandages (ace® or tetra®) are applied to extremity to well above expected level of frostbite. Extravasation of plasma due to edema and blistering may be minimized. The pressure dressings need not be removed for 10 to 12 days unless for sepsis or for other special reasons.

    Oxygen therapy may be required for severe generalized frostbite.

From the Hektoen Institute for Medical Research, the Department of Surgery, Cook County Hospital, and the Presbyterian Hospital.

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2. TO PREVENT INFECTION

Strict surgical asepsis to frostbitten area is carried out. Cleanse part, and apply sterile dry or petrolatum gauze dressings. No massage or snow is to be applied.

Antibiotics are administered daily for at least a few days or until oral temperature is normal. Antitetanic serum is given as indicated.

3. TO PREVENT INTRAVASCULAR CLOTTING AND GANGRENE

Thaw frostbitten extremity at room temperature only. No external heat or cold is to be applied.

Anticoagulant therapy must be started within 16 hours after thawing begins.

Heparin sodium, 50 mg. intravenously, is to be given as soon as possible and repeated every three hours until effective prothrombin deficiency is obtained with bishydroxycoumarin therapy.

Bishydroxycoumarin is started as soon as patient can swallow and blood prothrombin level has been obtained.

Initial dose is 300 mg. and subsequent daily doses are decided on after prothrombin level is determined.

Effective prothrombin level is between 10% and 20% of normal. Continue for eight days. No walking or trauma to feet or hands.

RESULTS

When compared to previous years, the results of our present routine treatment of acute frostbite with anticoagulant therapy were far more satisfactory. Only one patient required amputation of a finger, although considerable loss of tissue was usually expected. One patient had persistent dependent edema and paresthesia. One death due to massive retroperitoneal hemorrhage occurred after successive lumbar blocks, probably caused by the concomitant use of anticoagulant therapy. This case has been reported elsewhere.[6] The average period of hospitalization was 42 days and the longest 270 days (case 1); many patients who were not treated with anticoagulants required hospitalization for eight months to a year or more. The following two cases are described to illustrate the results of treatment in acute frostbite with anticoagulant (case 1) and without anticoagulants (case 2).

REPORT OF CASES

CASE 1.—Mr. P. B., 50, a Negro man, was brought to Cook County Hospital on Jan. 29, 1949, in an unconscious condition after prolonged exposure to cold. He had been under the influence of alcohol and had slept for about eight hours in a gangway when the temperature was about 10 F. All four extremities were "ice cold," stiff, and solid to touch. The dorsalis pedis and radial artery pulsations were not palpable, and the patient was considered to be in an extreme condition. Blood pressure was unobtainable on admission, and the heart beat was weak. Rectal temperature was too low to be recorded on a clinical thermometer.

Within one hour after admission and exposure to room temperature, both radial artery pulsations were weakly palpable, and the blood pressure was 108/70. Whole blood, 500 cc., was administered intravenously and was followed with 1,000 cc. of 5% dextrose solution. Heparin sodium, 50 mg., was given intravenously, and this was repeated every four hours for three days. The initial prothrombin level was 95% of normal, and eight hours after the patient's admission, bishydroxycoumarin treatment was started with a 300 mg. dose the first day and 200 mg. doses the second and third days. Within 72 hours the prothrombin level reached 31% and was further reduced to 12.5%. Bishydroxycoumarin was continued for 11 days. Penicillin was given in 300,000 unit doses every four hours for 14 days, at which time it was replaced by sulfadiazine, given orally.

The upper and lower extremities were treated locally with soap, water, and alcohol and the application of sterile petrolatum gauze pressure dressings. The initial dressings on the legs had not been applied high enough so that extensive bullae developed above the level of the dressings. Reapplication of the pressure dressings to extend above the knees prevented further development of bullae (fig. 1).

Except for a low grade fever that occasionally spiked to 103 F., the patient made a surprising recovery. He regained consciousness in eight hours. Pronounced fibrous tissue formation in the fingers and toes gradually improved with physiotherapy treatments, and only the right fifth finger required amputation, though all fingernails and toenails came off. He was discharged from the hospital on Sept. 20, 1949. The long period of hospitalization was due largely to the physiotherapy treatment that was required for the fibrous tissue formation in the extremities. Some residual fibrosis and swelling of the hands and feet were present when the patient was last seen one year after the frostbite.

It is impossible to predict the extent of gangrene and necrosis that would have developed if anticoagulant therapy had not been used. However, from our previous experience and from our observations on patients who were admitted too late for anticoagulant therapy to be used, it could be assumed that both hands and both feet would have become gangrenous and required amputation. The extreme fibrosis that occurred in the hands and feet and the fingers and toes is attributed to the failure of heparin sodium given every four hours to maintain continuous anticoagulation. Accordingly, heparin sodium is now given at three-hour intervals.

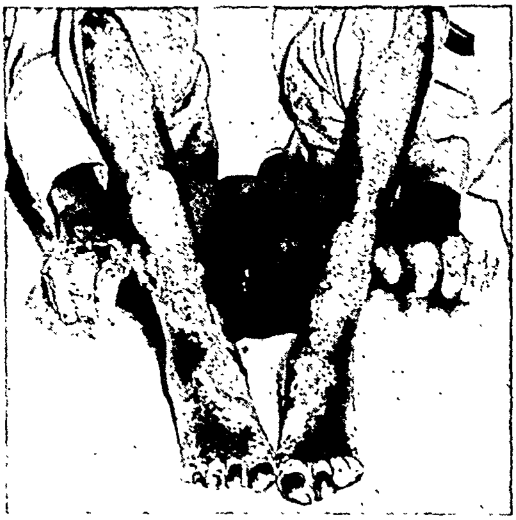

Fig. 1 (case 1).—Severe frostbite of all four extremities treated with anticoagulants within one hour after patient's admission to the hospital. Appearance at three weeks shows fibrous thickening of the digits and contracture deformities. Improvement followed physical therapy treatments. Gangrene of the right fifth finger required amputation later.

CASE 2.—Mr. W. H., 49, a white man, was admitted to the hospital four days after exposure to temperature of 0 F. for two hours. Although wearing gloves, his hands became cold, white, numb, and "frozen." He had been drinking, and friends at a gasoline station rubbed snow on the hands for "some time" and then took him to a local hospital. His hands became blue, swollen, and oozing to the level of the wrists. Blisters had been present. The feet were only slightly reddened and painful. Diagnosis on admission was "superficial gangrene." In the course of three weeks both hands to the level of the wrists became black and gangrenous (fig. 2). Bilateral amputations were required later.

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6. O'Connor, W. R.; Preston, F. W., and Theis, F. V.: Retroperitoneal Hemorrhage Following Lumbar Sympathetic Block During Treatment with Dicumarol, Ann. Surg. 131: 575, 1950.

It is not possible to predict the course that this patient would have had if our present regime for the treatment of frostbite could have been used. However in the fourteen cases treated with anticoagulants, such a tragic result did not occur despite apparently equally severe frostbite. In patients treated with anticoagulants no deep gangrene developed.

COMMENT

The confusion that has existed in the principles of treatment of acute frostbite seems to be clarified somewhat by recent investigations on the pathologic physiology of the injury. Ungley and Blackwood [7] and Ungley and others [8] consider the primary tissue damage a peripheral vasoneuropathy which produces a reduced blood supply, edema, and extravasation of blood. Therefore, they direct therapy to reduce the swelling by pressure bandages and to counteract the deficient oxygen supply; local tissue metabolism is diminished by prolongation of the period of thawing when the injured part is cooled. Another group, Greene,[9] Siegmund,[10] Friedman,[4] and Shumacker,[5] regards as principal damage the formation of thrombi in the arterioles and capillaries. These authors advise prompt restoration of circulation and prevention of thrombi by anticoagulant therapy.

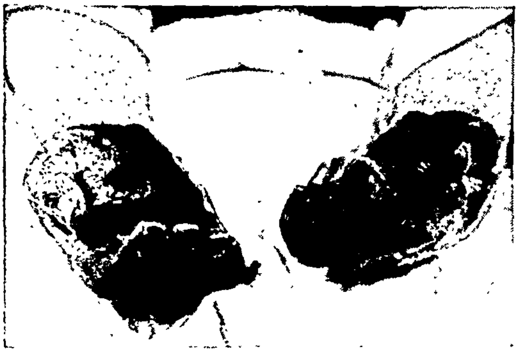

Fig. 2 (case 2).—Severe frostbite of hands before anticoagulant therapy was being used. Appearance at three weeks shows demarcation of dry gangrene of both hands which later required amputation.

Lange and his associates [3] have contributed greatly to our present knowledge of the physiology and pathology of acute frostbite in experimental animals by the use of fluorescein test, the capillary microscope, and histologic studies. They showed alteration of the blood circulation in the tissues during exposure to cold. Under the capillary microscope just before freezing occurs, the red cells are seen to collect in irregular clumps or masses with plasma in between until finally the circulation comes to a complete halt. At this stage, the fluorescein test shows a complete absence of dye from the affected tissues. This persists for about one hour after exposure and indicates a vasoconstriction and circulatory stasis. Clinically the limb has a white cadaverous appearance, which follows the initial blanching and pink color on exposure.

As thawing occurs, the blood flows again and the red cells gradually resume their discreteness. At this stage there is vascular engorgement, increased blood flow through the limb, and an increased capillary permeability. The fluorescein test shows hyperfluorescence in these tissues. As plasma rapidly diffuses into the interstitial spaces, the red cells silt up in the capillaries, forming a sludge that contains some platelets but little or no fibrin. These are not true fibrin thrombi but are called "agglutinative thrombi." Clinically the part becomes intensely red, rapidly swollen, and warm. Blebs and bullae develop, which contain a straw-colored or blood-tinged fluid with a protein content similar to that of plasma. Loss of sensation, especially to pin prick, heat, and cold, appears.

In the final stage, within 24 to 48 hours, a dense fibrin clot forms in the blisters. This same process probably takes place in the interstitial spaces after the exudation of plasma; as a result, new formation of fibrous tissue and scarring and damage to the muscles and nerves occur. Three to eight days after the exposure the agglutinative thrombi undergo hyalinization, resulting in occlusive masses. The fluorescein test will show patches of nonfluorescence, and, clinically, dry-black areas of gangrene are evidence of the vascular obstruction. These observations indicate that the fundamental lesions in acute frostbite are intravascular.

Since gangrene subsequent to frostbite appears to be due to the occlusive red cell thrombi, the early use of effective anticoagulant therapy is suggested to interrupt the chain of events. Heparin sodium is known to interfere with the adhesiveness of agglutinative thrombi, and this may prevent thrombosis and gangrene in acute frostbite. Anticoagulants also preserve the resorbability of the interstitial fluid, thereby preventing secondary fibrous tissue formation. This is evidenced by the absence of clot formation in blisters when adequate anticoagulant therapy is maintained.

Anticoagulant therapy to be beneficial in frostbite must be given promptly after exposure and in adequate and effective amounts. Shumacker,[5] on the basis of animal experiments, believes that anticoagulant therapy is of greater value in the milder forms of frostbite; the more prolonged the coagulation time, the greater will be the effectiveness of this treatment in prevention of gangrene. He also feels that the drugs are of value only when treatment is started within 16 hours after exposure. It is impossible to give absolute criteria for the effectiveness of anticoagulants in prevention or limitation of the extent of gangrene in frostbite. From experimental results, Shumacker, however, believes that anticoagulant therapy is a valuable adjuvant in prevention of frostbite necrosis.

SUMMARY

Fourteen of the 30 patients with acute frostbite admitted to Cook County Hospital of Chicago during the winters of 1949 and 1950 were treated with anticoagulants. The results were most gratifying, as only one of the treated patients required local amputation of a finger. The duration of hospitalization has been appreciably reduced, and the patients returned to normal activities more quickly.

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Anticoagulant therapy was instituted shortly after admission. Heparin sodium was given every three or four hours for maintenance of an elevated clotting time and until adequate effect with bishydroxycoumarin (dicumarol®) was produced. Other treatment is important and consists of combat of shock with blood and plasma infusions, thawing of the involved areas by exposure to room temperature only, cleansing and application of sterile dry or petrolatum gauze pressure dressings, and employment of antibiotics to combat infection. A report of the pathologic physiology and the experimental background of our present knowledge of acute frostbite has been presented. Case histories are abstracted to illustrate the treatment as now used and the results of treatment of acute frostbite with and without anticoagulant therapy. Adequate anticoagulant therapy in the acute stage of frostbite is of great value in reduction of the incidence and extent of gangrene and the period of disability.

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CLINICAL RESPONSE OF RHEUMATOID ARTHRITIS TO POSTPARTUM PLASMA

A TWO YEAR STUDY

Louis W. Granirer, M.D., Jamaica, N. Y.

The purpose of this paper is to summarize the clinical observations of eight patients with rheumatoid arthritis treated with postpartum plasma over a period of two years. These patients have now been followed long enough to permit an appraisal of this form of therapy.

A preliminary report of some of the earlier effects of postpartum plasma on these patients was made in a previous presentation.[1]

METHOD OF STUDY

This report covers the period from February, 1948, to May, 1950, and is based on observations of eight patients with rheumatoid arthritis. Only patients showing a chronic but active course of the disease were selected for treatment. All the patients had a disabling polyarticular rheumatoid arthritis graded as severe or very severe and were bedridden or confined to a chair. Patients were observed for a control period of at least two weeks prior to institution of therapy. In addition to the usual clinical observations, the total red and white blood cell count, differential count, erythrocyte sedimentation rate (Westergren), blood cholesterol and serum proteins were determined at frequent intervals. X-rays, blood pressure, and body weight were recorded routinely. Motion pictures were taken of most patients before, during, and after the use of postpartum plasma.

Table 1 contains certain data concerning the eight patients. Ages varied from 48 to 63 years. The duration of the arthritis was from 6 mo. to 18 years. Most of the patients walked with difficulty and required help. Subcutaneous nodules below the olecranon process were present in four cases. The classification of stages of rheumatoid arthritis and the criteria for therapeutic response of rheumatoid activity adopted by the New York Rheumatism Association were used in evaluating the results that are described in table 1.

Pooled postpartum plasma was administered intravenously in doses of 250 cc. once a week. In general, no toxic reactions were encountered other than an occasional attack of urticaria that responded promptly to antihistamine therapy. To provide controls, plain plasma transfusions in doses of 250 cc. each were administered weekly to a similar group of patients. No clinical or biochemical benefit occurred. When postpartum plasma was replaced by plain plasma symptoms were usually worse within a few days.

CLINICAL RESPONSE

Doses of less than 200 cc. of postpartum plasma were ineffective in producing a clinical response. It was soon noted that an improvement usually occurred between the fourth and sixth treatment. The average patient required 6 to 8 pt. (2.8-3.8 L.) of postpartum plasma before a remission took place.

The improvement was gradual, with relief of stiffness and decrease in pain, joint swelling, and inflammation. One patient with psoriatric arthritis has been symptom-free 18 mo. Four patients have maintained their improvement after treatment was discontinued 12 mo. There were no toxic effects and no cases of homologous serum hepatitis. Some patients required a larger amount of plasma given over a longer period of time before a beneficial effect was noted. The beneficial effect of postpartum plasma in a patient with severe asthma was observed during the course of treatment, suggesting an effect on the immune mechanisms underlying both conditions.

Four patients had typical subcutaneous nodules below the olecranon process. With treatment, these disappeared completely.

A dramatic effect on flexion contractures of recent origin was seen in two patients.

Analysis of the chemical determinations is demonstrated in table 2.

Two patients failed to respond. In retrospect, it appears that in both the course of therapy was too short (six treatments) and warrants no conclusion, since the therapeutic trial was obviously of insufficient length.

COMMENT

In the present study the number of patients treated with postpartum plasma was small. The results, however,

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Read before the Meeting of the New York Rheumatism Association, May 10, 1950.

From the Department of Medicine and the Arthritis Clinic, Queens General Hospital.

[1] Granirer, L. W.: Read before Seventh International Congress on Rheumatic Diseases, New York, June 1949, to be published.

over a two-year period showed a definite amelioration of the clinical manifestations. Although there was not always a complete disappearance of symptoms, relief was greater than with any preceding therapy. The patients experienced an improved sense of well-being, an increase in appetite, strength, and gained considerable weight.

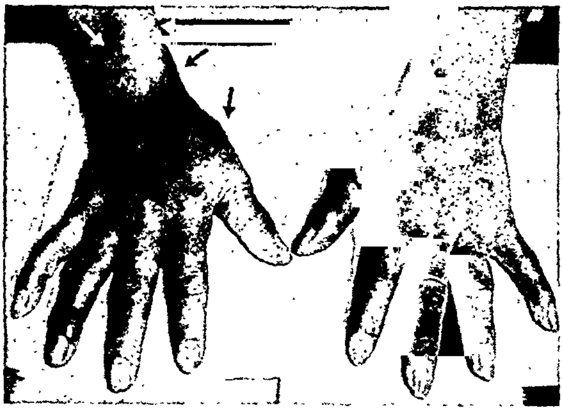

Fig. 1.—Hands of patient before treatment with postpartum plasma. Note swelling of the wrists and finger joints.

Associated with the clinical improvement, there was a return to normal of the serum albumin, globulin, and hemoglobin. Sedimentation rates remained elevated in most of the patients and were not found to be a dependable sign as to the clinical progress. The plasma cholesterol usually rose above the pretreatment levels as the patients improved.

On cessation of therapy a return of symptoms required from six weeks to 12 mo. The longest remission was 18 mo. In general, the return of symptoms was slow, and they never reached the former degree of severity. Resumption of postpartum plasma therapy was always effective when there was a recurrence of symptoms. Subcutaneous nodules completely disappeared, indicating that the antirheumatic substance or substances in postpartum plasma have a definite effect on the mesenchyme. In my experience postpartum plasma therapy distinctly changes the course of the disease. It shortens the activity of the illness and dramatically reduces the disability.

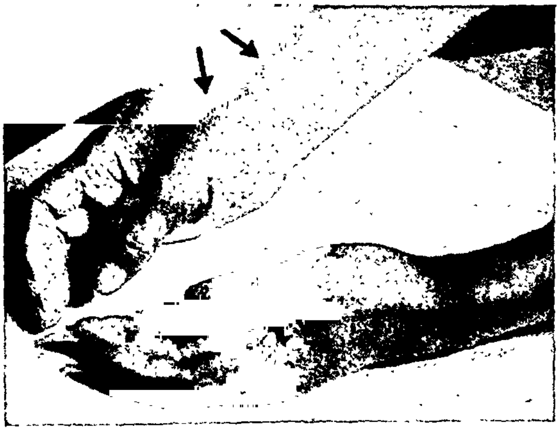

Fig. 2.—Hands of same patient, again before treatment; unable to close hands.

As a rule, no side effects were noted. There was no rise in blood pressure, blood sugar, or other undesirable chemical disturbance. One patient in whom urticaria developed after treatment responded well to antihistamines. Another complained of sensitive breasts. Ascheim-Zondek tests were negative in all cases. There were no complaints of acne, hirsutism, amenorrhea, moon face, pigmentation, or striae. Postpartum plasma almost uniformly possesses a greenish tint (pea soup) that is homogenously distributed; the albumin and globulin are low.[2] Postpartum plasma cholesterol is also low, and the phospholipids never exceed the upper limits of normal.[3]

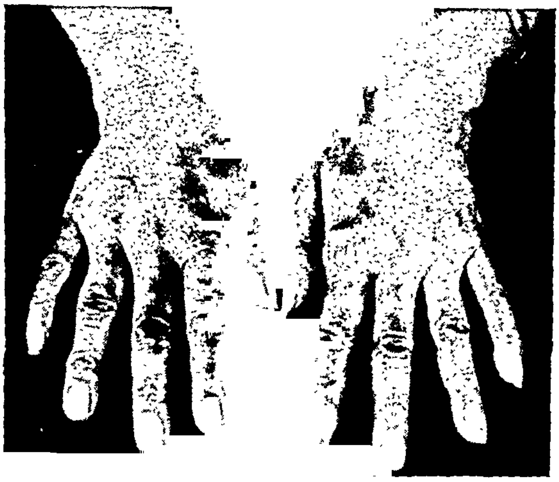

Fig. 3.—Hands of patient after treatment with postpartum plasma; disappearance of effusion and joint swelling.

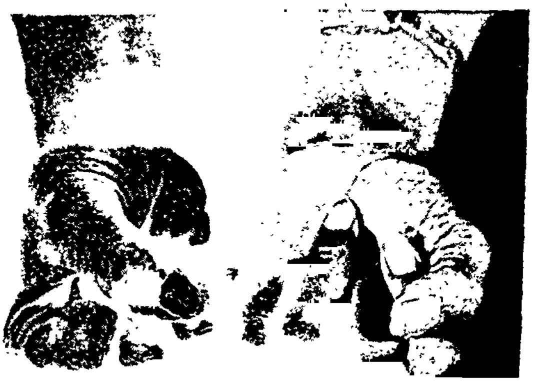

Fig. 4.—Hands of patient after treatment; patient can now completely close her hands.

The result of this preliminary study over a two-year period indicates that postpartum plasma is an effective mode of treatment for rheumatoid arthritis. Administration of the plasma over a long period can be well tolerated. Once a remission occurs treatment need not be taken continuously. Relapses are usually mild and gradual and respond well to further therapy. Postpartum plasma is an available antiarthritic agent, and its production is neither difficult nor costly. Although complete relief was not achieved in all cases, the results obtained with postpartum plasma, on the whole, were as dramatic as any recorded for cortisone or pituitary adrenocorticotropic hormone (ACTH).

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[2] Granirer, L. W.: A Study of the Albumin-Globulin Content In Postpartum Plasma, Science 3:204, 1950.

[3] Granirer, L. W.: A Study of the Lipids In Postpartum Plasma: Its Use in Rheumatoid Arthritis, Surg., Gynec. & Obst. 91:591-592 (Nov.) 1950.

ADDENDUM

Since July, 1950, seven patients resistant to previous cortisone and pituitary adrenocorticotropic hormone (ACTH) therapy have shown an excellent response to postpartum plasma. In this series there were five patients with severe rheumatoid arthritis, one patient with exfoliative dermatitis and arthritis, and one with Still's disease.

CONCLUSIONS

In the present study the number of patients treated was small, and it is realized that the results obtained in this initial study will have to be confirmed.

1. Pooled postpartum plasma produced a gradual and sustained remission in rheumatoid arthritis.

2. Remissions were observed to last from six weeks to one and one-half years.

3. The chemical abnormalities present in the disease were restored to normal.

4. Patients gained from to five to 30 lb. (2,200-13,600 gm.).

5. An improved sense of well-being, a better appetite, increased vigor, strength, and amelioration of joint pain and swelling were routinely observed.

6. There was no relationship between the sedimentation rate and the clinical improvement.

7. In more than 500 postpartum plasma treatments there were no instances of homologous serum hepatitis.

8. Unlike either pituitary adrenocorticotropic hormone (ACTH) or cortisone, postpartum plasma had no side effects; treatments were administered only once a week.

TABLE 1.—*Before and After Treatment with Pooled Postpartum Plasma*

Case	Age	Rheumatoid Arthritis Duration and Degree	Extent of Involvement	Complications	Weekly Dose	First Improvement Noted	Total No. of Treatments	Duration of Remission	Grade of Response	Comments
1	48	3 yr.; stage 3 (severe)	Shoulders, hands, wrists, elbows, knees, ankles, feet; bedridden	Alopecia	250 cc.	4 treatments	14	4 mo.	Grade 2 (marked)	Subcutaneous nodule below elbow disappeared after 9 treatments; hair on scalp returned; gained 19 lb.
2	42	9 yr.; stage 3 (severe)	Fingers, wrists, elbows, shoulders, hips, knees, ankles; bedridden; 1943, severe nephritis after gold salts	Cholecystectomy	250 cc.	5 treatments	16	14 mo.	Grade 2	Large subcutaneous nodule below both elbows disappeared after 6 treatments; gained 20 lb.
3	49	4 yr.; stage 3 (severe)	Shoulders, neck, elbows, wrists, fingers, knees, ankles; 1945, poor response to gold salts	....	250 cc.	4 treatments	12	12 mo.	Grade 2	Flexion deformity of knees corrected; gained 21 lb.
4	48	2 yr.; stage 3 (severe)	Neck, shoulders, wrists, hands, knees, ankles, feet	Asthma, bronchiectasis, 9 yr.	250 cc.	4 treatments	14	6 wk.	Grade 2	Asthmatic attacks infrequent; gained 26 lb.; subcutaneous nodules below both elbows gone after 10 treatments
5	63	18 yr.; stage 3 (severe)	Knees, shoulders, neck, elbows, wrists, hands	....	200 cc.	5 treatments	6	8 wk.	Grade 2	Better than she has been in yrs.; gained 5 lb.
6	52	6 mo.; stage 3 (severe)	Shoulders, elbows, knees, ankles, toes	Psoriasis, 8 yr.	250 cc.	3 treatments	10	18 mo.	Grade 2	Gained 28 lb.; no arthritis, no psoriasis
7	45	10 yr.; stage 3 (severe)	Shoulders, elbows, wrists, ankles, feet; 1945, exfoliative dermatitis 1 yr. after gold salts	....	250 cc.	4 treatments	14	6 mo.	Grade 2	Gained 10 lb.; nodule below elbow disappeared
8	45	3 yr.; stage 3 (severe)	Hands, wrists, elbows, ankles, feet	....	250 cc.	10 treatments	15	16 mo.	Grade 2	Gained 30 lb.

TABLE 2.—*Analysis of Chemical Changes in Patients Treated with Pooled Postpartum Plasma*

	Hemoglobin, Gm.		Red Blood Count, Millions		Albumin, Gm. per 100 Cc.		Globulin, Gm. per 100 Cc.		Total Cholesterol, Mg. per 100 Cc.		Erythrocyte Sedimentation Rate (Westergren), Mm. per Hr.		Weight, Lb.	
Case	Before Treatment	After Treatment	Before Treatment	After Treatment	Before Treatment	After Treatment	Before Treatment	After Treatment	Before Treatment	After Treatment	Before Treatment	After Treatment	Before Treatment	After Treatment
1	11.0	14.0	4.0	5.3	4.6	4.9	4.0	3.8	140	210	28	22	102	131
2	12.2	16.2	4.9	5.5	4.8	4.2	3.2	2.7	170	225	46	40	105	110
3	10.0	13.0	3.8	5.1	4.0	5.4	4.0	3.2	155	180	47	45	172	200
4	10.5	12.5	4.4	4.5	4.3	5.0	4.2	3.0	140	178	38	30	91	100
5	11.0	15.5	4.1	4.9	3.8	4.3	3.3	3.0	160	185	45	40	85	115
6	11.5	14.0	4.0	5.5	3.5	4.4	3.8	2.2	140	295	40	28	102	133
7	10.2	14.0	3.9	4.6	4.2	4.9	4.0	2.4	160	175	85	40	160	180
8	11.3	13.5	3.8	4.5	4.0	5.2	3.3	2.5	145	185	38	23	121	140

Nephrons and Glomeruli.—Each kidney has about 1,200,000 nephrons, each about 2 inches long, so that the combined length of all nephrons in an adult would amount to 75 miles. The length of individual capillaries in a glomerulus is about one inch: thus, the total of all capillaries in both kidneys would measure more than 37 miles. The entire filtering surface of all glomeruli exceeds twice the body surface.—F. R. Stearns, M.D., Man in Numbers, *Clinical Medicine*, February, 1951.

PROGNOSIS OF ANGINA PECTORIS AND CORONARY OCCLUSION

FOLLOW-UP OF 1,700 CASES

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There are comparatively few reports in the literature of large series of cases bearing on the prognosis of angina pectoris and coronary occlusion, and the available reports show considerable differences in their findings. Some of the reports refer only to cases that were followed till death and do not include those of patients still living, thus conveying a wrong impression of the actual prognosis.

As examples of the differences in the longevity figures of angina pectoris as reported in the literature are the following: Herrick and Nuzum [1] in a study of 200 patients, 50 of whom died, found the average longevity for the dead group to be three years. Mackenzie [2] reported on 380 patients, 214 of whom died, with an average longevity for the dead group of 5.4 years. White [3] reported on 200 patients, 66 of whom died with an average longevity of 3.4 years for the dead group. The average longevity of the remaining 134 living patients was 4.6 years. White and Bland [4] reported on 500 patients with angina pectoris who were under observation 23 years, between 1920 and 1943. At the end of that period, 445 were dead, the average longevity being 7.9 years. Of the 52 patients known to be still living, the average longevity was 18.4 years. Eppinger and Levine [5] reported 141 fatal cases, with an average longevity of 4.5 years. In 166 fatal cases of Wedd and Smith [6] the average longevity was 5.8 years. Parker and co-workers [7] reviewed the records of 3,440 cases of the Mayo Clinic. The average survival for their entire group was five years.

Because of the comparatively short time elapsed since coronary thrombosis became a recognizable clinical entity, very few reports have appeared in the literature to date on the ultimate prognosis of this phase of coronary disease. Conner and Holt [8] reported 287 cases, with an immediate mortality of 16.2%.

White [9] reported the case of one man who lived 17½ years and that of another man [10] who lived 25 years after an attack of myocardial infarction. Bedford [11] in a study of 31 cases found the average duration of life to be six months. He remarked that some persons may live more than 5 years. Drake [12] reported on a patient who lived 37 years after an attack of coronary thrombosis. Levine and Rosenbaum,[13] in a study of 372 cases, found the average longevity in 101 fatal cases to be 3.4 years. Master and co-workers [14] found a death rate of 8% up to the time of discharge from acute care in 243 patients with coronary occlusion.

Katz and co-workers [15] reported on 488 patients of myocardial infarction, some of whom were followed for variable periods up to six years. They estimated that about 25% died within the first two months, 50% by the end of the first year and 75% by the end of the third year.

Because of this comparative scarcity of reports on the prognosis of angina pectoris and coronary thrombosis and of the variations in the findings, I considered it of value to review a series of 1,700 cases that came under my observation during a period of 25 years. This report deals with such review.

SELECTION OF CASES

The cases consisted of those of private patients and those seen in consultation. Each case was followed over the entire period of observation either by me or by the physician in charge of the case. Those patients who did not come for a periodic check-up were followed by mail. If no reply was obtained by the time this statistical study was made, the case was not included in this review.

It is realized that the addition of new cases from year to year introduces some error in longevity. Much of this error, however, was partly overcome by a careful history of the exact date of onset of the clinical manifestations of the disease in each case.

COMPOSITION OF CASES

The 1,700 patients whose cases form the basis of this report consisted of 1,302 males and 398 females. The incidence of males to females was thus about 3.2:1. This male-to-female ratio is practically the same as in the report of White and Bland,[4b] but smaller than in that of Parker and co-workers,[7] in which the radio was 4.3:1.

At the time of submission of this report, 1,021 patients were living and 679 were dead. The 1,021 living patients consisted of 814 males and 207 females. The 679 dead consisted of 488 males and 191 females. The total percentage of dead was thus 39.9 for the entire group, 37.5 for the males and 47.9 for the females.

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OBSERVATIONS

Mode of Onset of Clinical Manifestations.—The onset of the clinical manifestations in this series is shown in table 1. In 809 cases the anginal syndrome developed and progressed slowly over a period of months or years, while in 891 cases the onset was abrupt in the form of a coronary occlusion with apparently no warning symptoms.

Age at Onset of Clinical Manifestations.—The average age at onset of the clinical manifestations for the entire series of 1,700 cases was 55.8 years. This is a little younger than in the series reported by White and co-workers,[4b] in which the average age at onset was 56.5 years, and still younger than in that of Parker and co-workers,[7] in which the average age was 57.1 years. The youngest ages at onset in our series were 22½ and 20 years, and the oldest were 84 and 93 years respectively, for males and females.

On breaking up the figures of the entire series of 1,700 cases into its male and female, living and dead components and in decades, the following features are observed, as shown in tables 2 and 3.

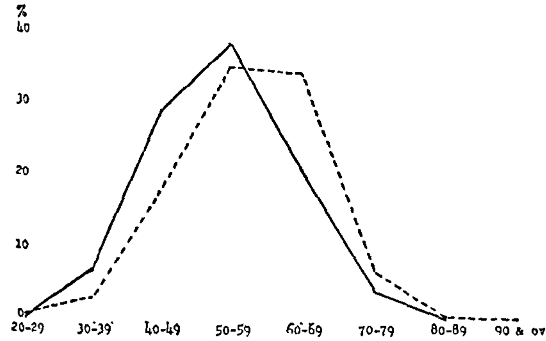

Chart 1.—Age at onset of clinical manifestations of coronary disease in the entire series of 1,700 cases. Solid line, males; broken line, females.

The disease developed in women on the average at an older age than in men and in the dead group at an older age than in the living group. Thus, the average age at onset among women was 56.7 years in the living group and 57.8 in the dead group, while in men it was 51.6 and 54.7 respectively, as shown in table 2. It was also observed that decade by decade the percentage number of cases in which the disease developed after 50 years in men and after 60 years in women is definitely greater in the dead group, as shown in table 3.

In both men and women and in the living and dead groups, the disease developed in the greatest number of patients between 50 and 59 years of age, comprising more than one-third of the cases of the entire series. Second in frequency were the ages 60 to 69 and third in frequency 40 to 49 years. These three age groups together comprised 87.9% of cases in men and 87.2% of cases in women. The rest were distributed in the ages younger than 40 years and older than 69 years. Of this remaining group the males comprised mainly the younger and females the older ages, as shown in table 3 and chart 1.

Age at Death.—The age at death in the group of 679 patients who died varied considerably, as shown in table 5 and chart 2. The average age for males was 58.8 years and for females 61.7 years. The youngest were 23 and 25 years and the oldest 85 and 94 respectively for males and females. A greater percentage of woman than of men lived beyond 60 years of age. The actual figures were 59.2% for females and 50.9% for males. Beyond 70 years of age 17.9% of females and 15% of males were still alive. Beyond 80 years only 3.7% females and 2.3% males were still living.

Table 1.—*Mode of Onset of Clinical Manifestations*

		Slow Onset		Acute Onset	
	Total No.	No.	%	No.	%
Males	1,302	587	45.1	715	54.9
Females	398	222	55.5	176	44.5

Chart 2 illustrates the age at onset and death among males and females per decade in the group that succumbed to the disease.

Length of Survival.—The survival period from the onset of the earliest clinical manifestations of the disease to death varied considerably in different individuals. In the series of 679 patients who died, the average length of survival was 4.7 years for males and 4.5 years for females. The shortest survival was three hours in a man who never presented symptoms of coronary disease and in whom acute coronary occlusion suddenly developed. The longest survival was 35 years in a man in whom signs of the anginal syndrome first developed at 35 years of age and who finally succumbed to an acute attack of coronary occlusion at 70 years.

These survival figures do not depict the true longevity in this disease. To get a true picture we must take into consideration also the length of survival of all living patients. Thus, of the 1,021 patients still alive at the time of this statistical study, the average length of survival was 5.5 years, and for males and females separately 5.3 and 5.6 years respectively. One patient was still living 32 years after the onset of symptoms.

A better idea of survival in this disease is obtained if we divide the entire series of patients into groups of given years, as is shown in table 4.

It will be observed here that in the dead group, 32.8% of the males and 34.5% of the females were still alive at the end of five years. At the end of 10 years 10% of the males and 9.4% of the females were still living. At the end of 15 years the percentages of survivors were 3.5 and 1.6% respectively for males and females. After the 15th year, the survival rate rapidly drops. This is shown graphically in chart 3.

Table 2.—*Youngest, Oldest and Mean Age at Onset of Clinical Manifestations in Years*

	Male		Female	
Age	Living Group	Dead Group	Living Group	Dead Group
Youngest	22½	23½	30	20
Oldest	78	84	87	93
Mean	51.6	54.7	56.7	57.8

In the group of 1,021 living patients the number living up to three years was disregarded, as that period was considered too short to be of value statistically. Those living longer assumed more significance as an index of longevity.

In table 4, under the group of 1,021 living patients, are summarized the number of patients still alive in each given year. It is possible, therefore, to include in any given year all other patients that remained alive longer.

Table 6 shows a few representative years with the number and percentage of patients still alive. It will be observed that as many as 67.1% of the males and 61.4% of the females were alive four years; 54.6% and 46.1% respectively, five years; 15.1% and 15.4% respectively, 10 years and 4.2% and 6.2% respectively 15 years and longer. When compared with the longevity in the dead group the percentage of patients in the living group was far greater year by year. The final longevity will be still greater if these patients are followed over a number of years to come.

It is of interest to find that a relatively smaller number of females than males were alive up to 10 years and a relatively larger number beyond that.

Causes of Death.—Of the 679 patients who died the causes of death were definitely ascertained for 393 cases and summarized in table 7. It will be noted that 83.5% of the patients died of underlying heart disease, the vast majority, namely 67.6% from coronary occlusion. Of the remaining 16.5%, approximately one-third died of cerebral vascular accidents, another third of cancer in various regions of the body, and the rest from a variety of other causes. The longevity in this group with coronary disease would, therefore, have been considerably increased in at least 16% of patients if no intercurrent disease terminated their lives.

Duration Between the Onset of Symptoms of Coronary Disease and First Attack of Coronary Occlusion.—Of the entire series of 1,700 patients, 1,208 had one or more attacks of coronary occlusion during the period of observation, and 492 have not had any attack so far. Of the 1,208 who sustained one or more acute attacks of occlusion, 878 exhibited such an attack as the first manifestation of coronary disease. The other 330 patients have had preexisting symptoms for variable periods before such attack.

In the 330 patients who had shown symptoms previous to the onset of coronary occlusion, the duration between the onset of symptoms and the first attack of occlusion varied considerably, as shown in table 8. The average duration was 3.9 years for male subjects and 3.4 years for female subjects. The longest duration was 21 years and the shortest two hours. *On the basis of these findings* it appears that occlusion occurs most frequently between three months and two years after the onset of the anginal syndrome.

TABLE 3.—*Age at Onset of Clinical Manifestations in Decades*

	Living Group				Dead Group				Total			
	Males		Females		Males		Females		Males		Females	
Age, Yr.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
20-29	4	0.5	0	....	3	0.6	4	2.1	7	0.6	4	1.0
30-39	65	8.0	9	4.4	29	6.0	4	2.1	94	7.2	13	3.3
40-49	263	32.3	43	20.8	110	22.5	29	15.0	373	28.7	72	18.0
50-59	307	37.7	82	39.6	191	39.1	57	29.0	498	38.2	139	35.0
60-69	152	18.7	61	29.4	115	23.4	75	30.0	267	21.0	136	34.2
70-79	23	2.8	11	5.3	38	8.0	18	10.0	63	4.1	29	7.2
80-89	0	....	1	0.5	2	0.4	2	1.4	2	0.2	3	0.8
90 and over	0	....	0	....	0	....	2	1.4	0	....	2	0.5

TABLE 4.—*Length of Survival of 679 Dead and in 1,021 Living Patients with Coronary Disease*

	Dead Group						Living Group			
	Males (488)			Females (191)						
		Still Living			Still Living		Males (814)		Females (207)	
Years After Onset of Symptoms	No. Dead	No.	%	No. Dead	No.	%	No.	%	No.	%
½	28	460	94.3	12	179	93.7	40	5.0	11	5.3
1	47	413	84.6	13	166	86.9	65	8.0	14	6.7
2	58	355	72.7	24	142	74.3	75	9.2	27	13.0
3	74	281	57.6	34	108	56.5	86	10.6	28	13.5
4	58	223	45.7	23	85	44.5	102	12.5	32	15.3
5	63	160	32.8	19	66	34.5	85	10.4	20	9.7
6	42	118	24.2	14	52	27.2	90	11.1	14	6.7
7	30	88	18.0	11	41	21.5	63	7.4	14	6.6
8	16	72	14.8	8	33	17.3	49	6.1	9	4.3
9	10	62	12.7	8	25	13.1	37	4.5	7	3.4
10	13	49	10.0	7	18	9.4	30	3.8	6	3.0
11	11	38	7.8	2	16	8.4	29	3.7	4	2.0
12	6	32	6.6	8	8	4.2	15	1.9	7	3.4
13	5	27	5.5	1	7	3.7	7	0.9	1	0.5
14	6	21	4.3	0	7	3.7	11	1.4	1	0.5
15	4	17	3.5	4	3	1.6	8	1.0	3	1.5
16	3	15	3.1	1	2	1.0	5	0.6	2	1.0
17	2	12	2.4	1	1	0.5	4	0.4	2	1.0
18	2	10	2.0	1	0	...	5	0.6	1	0.5
19	1	9	1.8	..	..	...	0	...	0	...
20	5	4	0.8	..	..	...	4	0.4	0	...
21	2	2	0.4	..	..	...	2	0.2	..	...
23	..	..	...	..	..	...	1	0.1	..	...
24	..	..	...	..	..	...	..	...	1	0.5
25	1	1	0.2	..	..	...	..	...	..	...
27	..	..	...	..	..	...	..	..	1	0.5
28	..	..	...	..	..	...	1	0.1	..	...
29	..	..	...	..	..	...	..	...	1	0.5
32	..	..	...	..	..	...	..	...	1	0.5
35	1	0	0.0	..	..	...	..	...	..	...

Duration Between the First Attack of Coronary Occlusion and the Present Age of Living Patients.—Of the 1,208 patients who had at least one attack of coronary occlusion, 785 were still alive when this report was compiled; of these, 650 were males and 135 females. The average duration between the first attack and the present age was 4.9 years for males and 4.5 years for females.

Table 9 summarizes the number and percentage of cases in the respective months and years that elapsed between the first attack of coronary occlusion and the time that this report was compiled.

It will be noted that as many as 45.3% of the males and 37.8% of the females were alive five years or more after the first attack; 10.7 and 10.4 of males and females respectively were still alive 10 years or more, and 2.1% of the males were still alive 15 years or longer.

Duration Between First Attack of Coronary Occlusion and Death.—Of the 423 cases of coronary occlusion who ultimately died, the average duration of life between the first attack of coronary occlusion and death was 3.8 years for males and 3.1 years for females.

TABLE 5.—*Age at Death*

	Males		Females	
Age in Years	No.	%	No.	%
20-29	2	0.4	2	1.1
30-39	11	2.2	3	1.6
40-49	56	11.5	19	9.9
50-59	171	35.0	55	28.2
60-69	175	35.9	78	41.3
70-79	62	12.7	27	14.2
80-89	11	2.3	5	2.6
90 and over	0	....	2	1.1
Mean age	58.8 yr.		61.7 yr.	
Youngest	23 yr.		25 yr.	
Oldest	85 yr.		94 yr.	

TABLE 6.—*Number and Percentage of Patients Alive During the Given Years in the Living Group of 1,021*

	At End of 4 Yr.		At End of 5 Yr.		At End of 10 Yr.		At End of 15 Yr.	
Sex	No.	%	No.	%	No.	%	No.	%
Males	548	67.1	446	54.6	122	15.1	30	4.2
Females	97	61.4	65	46.1	31	15.4	12	6.2

Table 10 summarizes the longevity between the first attack of coronary occlusion and death.

It will be noted that 68.4% of the males and 84.8% of the females died within 4 years after the first attack of coronary occlusion. Only 31.6% of the males and 15.2% of the females lived 5 years of longer, and 8.8% of the males and 7.2% of the females lived 10 years or longer. It is of interest also to find that 1.5% of the males and 1.6% of the females lived 15 years or longer after an acute attack of coronary occlusion.

COMMENT

When we speak of the prognosis of angina pectoris and coronary occlusion, we have in mind the outlook in any given case in which the patient suffers from degenerative coronary disease. The pathology was fully discussed before. In brief, it consists of coronary arteriosclerosis, atheromatosis, and in some cases intra-arterial wall hemorrhages. These changes result in a gradual narrowing and finally complete obstruction of one or more branches of the coronary arterial tree with or without a fresh thrombosis. These degenerative processes usually progress slowly over a period of years and are not detectable until they reach a stage when clinical manifestations appear.

There are many cases in which no clinical manifestations of the disease appear until either an acute episode of coronary occlusion occurs or sudden death takes place. In many of these, autopsy findings may reveal extensive coronary disease which has surely taken years to develop and yet the patient was asymptomatic during life. Thus, in an analysis of the autopsy findings of 2,030 cases of sudden and unexplainable death, Rabson and Helpern[16] found that 45% were attributed to disease of the heart and aorta and 30.4% of these were caused by coronary artery sclerosis. In the latter, 75.5% showed no fresh thrombosis.

TABLE 7.—*Causes of Death in 393 Cases of Coronary Disease*

	Cases	
	No.	%
Cardiac death	328	83.5
Coronary occlusion	221	67.6
Sudden	54	16.5
Decompensation	50	15.3
Stokes-Adams syndrome	2	0.6
Subacute bacterial endocarditis	1	0.3
Cerebral accident	20	5.1
Cancer (various parts of the body)	22	5.6
Other causes	23	5.8
Pulmonary embolization	3	0.8
Postoperative	7	1.8
Ruptured aneurysm	3	0.8
Hodgkin's disease, leukemia	4	1.0
Nephritis	2	0.6
Accident, pneumonia	2	0.6
Cirrhosis of liver	1	0.3
Dementia	1	0.3

TABLE 8.—*Duration Between Onset of Symptoms of Coronary Disease and First Attack of Coronary Occlusion*

	Males (260)		Females (70)	
Duration	No.	%	No.	%
1 day	3	1.1	1	1.4
2-6 days	9	3.5	3	4.3
1-4 wk	16	6.1	4	5.7
1-2 mo	23	8.8	5	7.1
3-6 mo	46	17.7	8	11.4
7-12 mo	35	13.5	10	14.3
1½-2 yr	35	13.5	15	21.5
3 yr	22	8.4	1	1.4
4 yr	18	6.9	4	5.7
5 yr	12	4.6	4	5.7
6 yr	9	3.5	3	4.3
7 yr	7	2.7	1	1.4
8 yr	7	2.7	5	7.1
9 yr	2	0.8	2	2.9
10 yr. or more	16	6.2	4	5.8
Longest	21 yr.		17 yr.	
Shortest	2 hr.		24 hr.	
Average	3.9 yr.		3.4 yr.	

For these reasons the actual prognosis of coronary disease from its early development to death cannot be estimated. We can speak only of the period from the onset of clinical manifestations. When thus considered, we find by experience that in a great many cases the symptomatology of coronary disease, expressed mainly in the anginal syndrome, does not progress uninter-

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16. Rabson, S. M., and Helpern, M.: Sudden and Unexpected Natural Death, Am. Heart J. 35:635, 1948.

ruptedly from its inception to the end. It exhibits itself by periods of remission or quiescence and exacerbation or crisis. In some cases the anginal syndrome may occur for a variable period and subside, leaving the patient in a comfortable state for many days, weeks, months, or even years, only to recur again. It is very likely, as Blumgart and co-workers[17] have demonstrated, that in many cases during the period when the anginal syndrome is present, closure of vessels is taking place, even though the classic criteria of coronary thrombosis are absent. In many cases of uncomplicated angina pectoris the patients have been found by these authors to have old occlusions of one or more of the coronary arteries. That the typical picture of coronary occlusion was not evident is due to the fact that occlusion was gradual and there was time for a collateral circulation to develop.

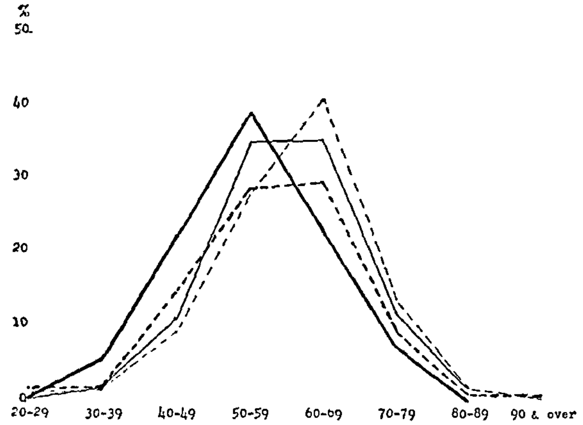

Chart 2.—Age at onset and at death in the group of 679 cases that died from coronary disease. *Solid heavy line, age at onset, males; solid thin line,* age at death, males; broken heavy line, age at onset, females; broken thin line, age at death, females.

Because of the periods of remission of the anginal syndrome, we must be extremely careful in taking a history to determine the exact time of onset of symptoms. In many of the cases of this study it was difficult to fix the exact date of such onset, especially if the syndrome was of long duration. Only on careful inquiry, which was made in each of the cases, and on helping the patient in his recollections by association with other events could the time be fixed. It is therefore, understandable how errors might arise in the study of any series of cases unless great care is exercised. Even then the recollection of some persons may not be entirely reliable.

The mode on onset of the clinical manifestations in our series was either in the form of an acute episode or in a slowly progressing manner. In approximately half of the cases the onset was acute, in the form of the classic manifestations of coronary occlusion. This occurred more frequently in males. It is important to note that even in this acute group, some of the patients gave a history of antecedent vague digestive disturbances and other unexplainable symptoms for a variable period before the acute episode, and these may have been due to coronary insufficiency. For instance, some complained of vague "rheumatic" aches and pains in the shoulders, arms or in the back of the neck appearing at irregular intervals, especially in cold weather, not related to exertion, for some months before an acute attack. Others complained of occasional spontaneous fleeting precordial discomfort, a tired feeling or other vague disturbances.

The observations in this study that in the group who died the disease developed a little later than in the living group would tend to indicate that the chances of survival are greater if the onset of the disease occurs earlier in life. This appears to be contrary to the belief that the earlier the onset of clinical manifestations the shorter the life. This may be true if we compare the longevity of patients with coronary disease with the longevity of the general population, but it does not appear to be true in the longevity curves of patients with coronary disease itself. These findings confirm those of other authors that in women the disease develops later in life and they die later than men. The later death is due not to a greater longevity, but to the later development of the disease.

As pointed out before, in estimating the average length of survival in angina pectoris and coronary occlusion, we must take into consideration not only those patients who died but also those remaining alive over a given period. This is shown in this series, in which the average length of survival in the living group of 1,021 patients at the time of compilation of the statistics was already greater than in the dead group of 679 patients.

The estimated *average duration of life of 4.6 years for the dead group and 5.5 years for the living group in* this series gives an inaccurate idea of the actual longevity. As many as 32.8% of the males and 34.5% of the females were still living at the end of five years in the group of 679 patients who ultimately died. Of the 1,021 living patients as many as 54.6% of the males and 46.1% of the females were alive five years or longer and as many as 15.1% of the males and 15.4% of the females were alive 10 years or longer. The percentage of patients alive 15 years or longer was 4.2 for males and 6.2 for females. One patient was still alive 35 years after the onset of the disease.

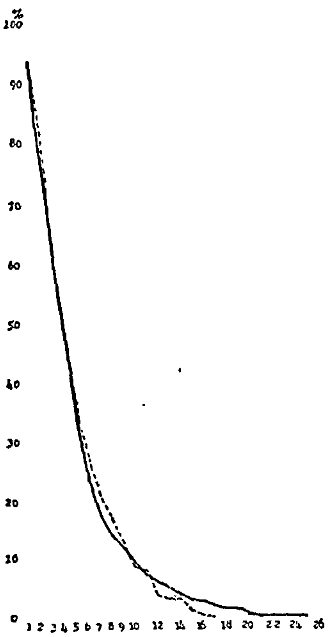

Chart 3.—Percentage of the 679 patients who eventually died still alive at the end of the given year. Solid line, males; broken line, females.

In considering the longevity in coronary disease we must also bear in mind the fact that a good proportion of such patients are killed by other disease. Of the 393 patients for whom the cause of death was ascertainable, 16.5% died from other than the coronary disease. Had life not been terminated by the other diseases, the patient would undoubtedly have lived longer thus lengthening the longevity figures.

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17. Blumgart, H. L.; Schlesinger, M. J., and Davis, D.: Studies on the Relation of the Clinical Manifestations of Angina Pectoris, Coronary Thrombosis and Myocardial Infarction, Am. Heart J. **19:** 1, 1940.

The observation in this study that 72.6% of the 1,208 patients with coronary thrombosis had no clinical evidence of coronary disease before the first attack of coronary occlusion is a little higher than that of Conner and Holt.[8] In their series of 287 patients, 62% had no antecedent circulatory symptoms.

TABLE 9.—*Duration Between First Attack of Coronary Occlusion and Present Age of Living Patients*

Time	Males (650)		Females (135)	
	No.	%	No.	%
1-2 mo.	3	0.5	1	0.7
3-6 mo.	47	7.2	12	8.9
7 mo.-1 yr.	60	9.2	12	8.9
2 yr.	74	11.3	20	14.8
3 yr.	77	11.8	20	14.8
4 yr.	96	14.7	19	14.1
5 yr.	57	8.8	12	8.9
6 yr.	68	10.4	8	5.9
7 yr.	46	7.1	8	5.9
8 yr.	34	5.2	7	5.2
9 yr.	20	3.1	2	1.5
10 yr.	17	2.6	4	3.0
11 yr.	13	2.0	4	3.0
12 yr.	10	1.5	5	3.7
13 yr.	3	0.5	0	...
14 yr.	13	2.0	1	0.7
15 yr.	3	0.5	..	...
16 yr. and over	9	1.6	..	...

In 330 patients in the present series who had antecedent symptoms before the first attack of coronary occlusion, the duration of symptoms before the attack varied considerably, the average being 3.9 years for males and 3.4 years for females. However, as many as 27.4 and 32.9% of the males and females respectively had the attack four years or longer after the onset of symptoms and in 6.2% of the males and 5.8% of the females the attack occurred 10 years or longer after the onset. The longest period was 21 years for males and 17 years for females.

Of particular interest in this study is the longevity after the first attack of coronary occlusion. This appears to surpass the findings of Conner and Holt,[8] Katz and co-workers,[15] and of Levine and Rosenbaum.[13] Of 117 patients who recovered from the first attack in the Conner and Holt series, 75% were in good health at the end of the first year, 56% at the end of the second year, 21% at the end of the fifth year and 3.4% at the end of 10 years. One patient lived 18 years and died after a second attack. The comparatively short period of observation and incomplete follow-up in the series reported by Katz and co-workers appears to yield approximately the same findings. Of 101 patients who survived the first attack in Levine and Rosenbaum's series, the average longevity was 41.1 months. About 25% died within one year, 50% within two years and 75% within five years and the remainder between five and 12 years. One was alive 25 years after the first attack.

In the series of 1,208 patients here reported on who have had at least one attack of coronary occlusion, the average duration of life of the 423 who eventually died was only 3.8 years for males and 3.1 years for females. This is approximately the same as in the series of Levine and Rosenbaum.[13] however, of the 785 patients in the series under study who were still alive, the average duration of life up to the time of this report was 4.9 years for males and 4.5 years for females, which greatly surpass the findings of Levine and Rosenbaum, and the patients were all still alive. Likewise, even in the group that ultimately died in the series reported here the specific longevity of the number remaining alive after a given period was considerably longer than in the series of Levine and Rosenbaum and that of Conner and Holt. Thus in the series under study here 83.1% of the males and 81.5% of the females were still alive two years or more after the first attack, and 45.3% of the males and 39.8% of the females were still alive five years or longer. The percentage number still alive 10 years or over was 10.7 for males and 11.4 for females. One of the patients was still alive 30 years after an attack of coronary occlusion. The longevity in this case surpassed that in all the reported cases except that of Drake,[12] whose patient died 38 years after the first attack. There is a possibility that my patient may ultimately reach that longevity, for he was in good health at the time this report was compiled.

SUMMARY

A statistical study was made of 1,700 patients with angina pectoris and coronary occlusion observed over a period of 25 years. Of these, 1,302 were males and 398 females. The ratio of males to females was thus about 3.2:1. Of the entire series, 1,021 were still living and 679 were dead.

The onset of clinical manifestations was slow in 809 cases and abrupt, in the form of an acute coronary occlusion, in 891.

The over-all average age at onset for the entire series was 55.8 years. The youngest age was 20 years and the oldest 93 years. The average age at onset in the living group was 56.7 years for females and 51.6 years for males; in the dead group, 57.8 and 54.7 respectively. The ages at onset in the order of frequency were between 50 and 59 years, 60 and 69 years, and 40 and 49 years. These comprised 87.9% of the males and 87.2% of the females. The balance were distributed in the ages younger than 40 years and older than 69 years, males comprising mainly the younger and females the older ages.

TABLE 10.—*Duration Between First Attack of Coronary Occlusion and Death*

Time	Males (296)		Females (127)	
	No.	%	No.	%
Less than 1 mo.	21	7.3	11	8.8
1-2 mo.	14	4.1	11	8.8
3-6 mo.	28	9.5	16	12.6
7 mo.-1 yr.	41	14.0	18	14.2
2 yr.	34	11.5	19	14.4
3 yr.	38	12.9	15	11.8
4 yr.	27	9.1	18	14.2
5 yr.	27	9.1	3	2.4
6 yr.	19	6.4	0	...
7 yr.	7	2.4	2	1.6
8 yr.	8	2.8	3	2.4
9 yr.	6	2.1	2	1.6
10 yr.	4	1.4	4	3.2
11 yr.	7	2.4	1	0.8
12 yr.	6	2.1	1	0 8
13 yr.	4	1.1	1	0.8
14 yr.	0	...	0	...
15 yr.	1	0.3	2	1.6
16 yr.	1	0.3	..	...
17 yr.	1	0.3	..	...
18 yr.	1	0.3	..	...
30 yr.	1	0.3	..	...

The average age at death for males was 58.8 years and for females 61.7 years. The youngest age was 23 years and the oldest 94 years. The percentage number of patients who lived beyond 60 years of age was 59.2% for women and 50.9% for men; beyond 70 years, 17.9% for females and 15.0% for males, and, beyond 80 years, 3.7 % for females and 2.3% for males.

The average length of survival of the 679 patients who died was 4.7 years for males and 4.5 years for females. The shortest survival was three hours and the longest 35 years. The percentage of patients still living at the end of five years was 32.8 for males and 34.5 for females; at the end of 10 years, 10 for males and 9.4 for females; and, at the end of 15 years, 3.5 for males and 1.6 for females.

The average length of survival of the 1,021 patients that were still living was 5.3 years for males and 5.6 years for females. One patient was still alive 32 years after the onset of symptoms. The percentage of patients still living at the end of 5 years was 54.6 for males and 46.1 for females; at the end of 10 years, 15.1 for males and 15.4 for females, and, at the end of 15 years, 4.2 for males and 6.2 for females.

Of 393 patients the cause of whose death was known, death was due to the underlying heart disease in 83.5% and to other causes in 16.5%.

Of 1,208 patients who had one or more attacks of coronary occlusion, 878 had the attack as a first manifestation of coronary disease. In 330 who had had symptoms previous to occlusion, the average duration from the onset of symptoms to the first attack of coronary occlusion was 3.9 years for males and 3.4 years for females. The longest duration was 21 years and the shortest two hours.

In 785 patients who were still alive after one attack or more of coronary occlusion, the average duration between the first attack and the time when records were reviewed was 4.9 years for males and 4.5 years for females. About 45.3% of the males and 37.8% of the females were alive 5 years or more; 10.7% and 10.4% respectively, 10 years or more, and 2.1%, 15 years or more.

In 423 patients with coronary occlusion who ultimately died, the average longevity after the first attack was 3.8 years for males and 3.1 years for females. About 68.4% of the males and 84.8% of the females died within 4 years after the first attack; about 31.6% of the males and 15.2% of the females lived 5 years or longer; 8.8% of the males and 7.2% of the females, 10 years or longer, and 1.5% of the males and 1.6% of the females, 15 years or longer.

This study, like every other study of this kind, is based on the duration of the clinical manifestations of degenerative coronary disease, not on the duration of the evolution of the structural pathology from its inception. The early phases of the latter, lasting many months or years, are undoubtedly asymptomatic in most cases and, therefore, antecede the clinical manifestations by that length of time. The entire duration of the evolution of structural coronary disease can, therefore, not be ascertained.

255 Eastern Pkwy.

THE ACTION OF PROCAINE AMIDE IN CARDIAC ARRHYTHMIAS

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and
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It has been demonstrated that procaine applied locally to the heart reduces cardiac irritability as indicated by the added intensity of stimulation necessary to induce extrasystoles or ventricular fibrillation.[1] It has also been shown that after procaine administration a larger dose of epinephrine is required to produce ventricular fibrillation during chloroform anesthesia.[2] Since the administration of procaine in man may be followed by untoward reactions, Burstein and others[3] studied the effect of less toxic substances chemically related to procaine. They found that several related compounds protected dogs from epinephrine-cyclopropane ventricular fibrillation. Brodie, Lief and Poet[4] demonstrated that procaine administered intravenously in man is hydrolyzed rapidly to paraaminobenzoic acid and diethylaminoethanol. Because of the high concentration and relative persistence of diethylaminoethanol in the plasma, Rosenberg and others[5] studied the effect of this compound on cardiac arrhythmias. The drug prevented the development of ventricular ectopic beats in dogs under cyclopropane anesthesia. It suppressed ventricular premature contractions for a variable period in human subjects and restored normal rhythm in six cases of ventricular tachycardia. Its usefulness was somewhat limited by its hypotensive effects and its relatively rapid transformation in vivo. Mark and others,[6] in a search for a drug having the activity of procaine without its toxicity, studied the action of various amides and esters of diethylaminoethanol. They found that the amide of procaine was the most promising in that this compound was not affected by the plasma enzyme that hydrolyzes procaine, plasma levels were well sustained, and the drug could be administered orally, since gastrointestinal absorption was complete. They reported the suppression of ventricular premature contractions in man and the termination of prolonged attacks of ventricular tachycardia in three

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Fellow of the National Heart Institute (Dr. Miller).

Dr. Lewis H. Wright of E. R. Squibb & Sons supplied the procaine amide.

From the Division of Medicine (Cardiology), School of Medicine, University of Southern California, the Los Angeles County Hospital and the Medical Service, Cedars of Lebanon Hospital.

[1] (*a*) Mautz, F. R.: The Reduction of Cardiac Irritability by the Epicardial and Systemic Administration of Drugs as a Protection in Cardiac Surgery, J. Thoracic Surg. **5**: 612, 1936. (*b*) Beck, C. S., and Mautz, F. R.: The Control of the Heart Beat by the Surgeon, Ann. Surg. **106**: 525, 1937.

[2] Hermann, H., and Jourdan, F.: Cocaïne, et syncope adrénalino-chloroformique, Compt. rend. Soc. biol. **106**: 1153, 1931.

[3] Burstein, C. L.; Marangoni, B. A.; DeGraff, A. C., and Rovenstine, E. A.: Laboratory Studies on the Prophylaxis and Treatment of Ventricular Fibrillation Induced by Epinephrine During Cyclopropane Anaesthesia, Anesthesiology **1**: 167, 1940.

out of four patients. Procaine amide differs from procaine only in having the amide grouping (CO.NH.) in place of the ester grouping (CO.O.) of procaine (fig. 1).

SUBJECTS CHOSEN AND METHOD OF STUDY

Our interest was chiefly in the action of procaine amide on rhythms of ventricular origin, since it has been claimed that procaine and diethylaminoethanol affect only such rhythms. However, a group of patients with auricular arrhythmias was also included. In order to eliminate the possibility of spontaneous variations in rhythm, only those patients who had very frequent and persistent premature systoles were selected. Patients who had frequent premature beats alternating with periods of normal rhythm were excluded. In the patients with ectopic tachycardias, the abnormal rhythm had been present for from one to 24 hours before the drug was administered.

TABLE 1.—*Types of Cardiac Disease in Which the Action of Procaine Amide Was Studied*

	No. of Patients
Chronic coronary disease	21
Rheumatic heart disease	9
Hypertension	7
Myocardial infarction	6
Congenital heart disease	1
Syphilitic heart disease	1
No organic heart disease	10

PROCEDURE

The effect of an intravenous injection of procaine amide was studied in 55 patients with various disturbances in cardiac rhythm. (The types of cardiac disease are listed in table 1.) The usual dose was 500 mg.; however, in one patient 250 mg. was used, in two the dose was 400 mg., and in four patients with ventricular tachycardias, a second dose of 500 mg. was administered. At the outset of the study, the drug was administered slowly over a period of two to three minutes. It was found that there were no untoward reactions following a more rapid injection, and in some instances the dose was injected within one minute. However, the rapider injection seemed to have no advantage, and the slower rate appeared to be desirable. A control electrocardiogram was made before the administration of the drug and continued during, and for several minutes after, the injection. Records were then taken at five and 10 minute intervals for a variable period, in some instances for several hours. The pulse was palpated frequently by the observer and a record made whenever a disturbance in rhythm was detected. Frequent blood pressure readings were made and any evidence of untoward effect noted.

TABLE 2.—*Effect of Procaine Amide in 55 Patients*

Type of Arrhythmia	No. of Patients	Result
Premature beats		
Ventricular	31	Ectopic beats eliminated in 26
Auricular	1	No effect
Auricular and ventricular	1	Ectopic beats reduced
Ectopic tachycardias		
Ventricular	8	Cessation of ventricular rhythm in 4, slowing of rate in 4
Supraventricular	4	Sinus rhythm in 3, slowing of rate in 1
Auricular fibrillation with	6	Sinus rhythm in 1, no effect in 5
ventricular premature beats	6	No effect on auricular fibrillation, premature beats eliminated

RESULTS

Of 55 patients who received procaine amide intravenously, the cardiac arrhythmia was modified in 46. Of 31 patients in whom the arrhythmia was due to frequent ventricular systoles, the ectopic beats were eliminated in 26. The effect was observed usually within one minute after the administration of the drug. Frequent auricular extrasystoles were not affected in one patient and in another case beats from auricular and ventricular foci were definitely reduced in frequency. The drug was administered in eight attacks of ventricular tachycardia. The rhythm was unmodified in four, but the rate was definitely reduced. In four instances the ventricular rhythm was abolished. Of four patients who had supraventricular tachycardias, sinus rhythm was restored in three. The drug was administered to 12 patients with auricular fibrillation. The arrhythmia was of the chronic type in 11 and was paroxysmal in one. In the latter patient sinus rhythm appeared within 90 seconds after the injection. It is possible that this effect may have been coincidental and not a result of the drug. However, the appearance of the sinus beats corresponded well with the usual onset of the drug action. In the 11 patients with chronic auricular fibrillation, the auricular rhythm was not modified. Six of these patients also had ventricular premature beats, and these were eliminated in each instance. Although the auricular fibrillation persisted, a slowing and widening of the fibrillation waves was observed. Table 2 shows the effects of the drug in the various arrhythmias. Typical effects of procaine amide are shown in figures 2 to 7.

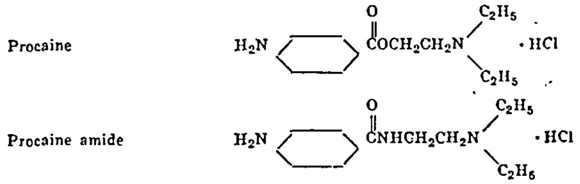

Fig. 1.—Structural formulas of procaine and procaine amide.

COMMENT

The present observations indicate that procaine amide is very effective in abolishing ectopic beats and rhythms. Although our study deals chiefly with ectopic ventricular rhythms, there is evidence that supraventricular rhythms may also be influenced. In therapeutic doses, there are either mild untoward reactions or none. The mechanism of action of the drug requires further study. The fact that ventricular beats are more consistently affected suggests that the drug does not produce its effect entirely by a quinidine-like action. Quinidine sulfate inhibits both auricular and ventricular rhythms, and its action on the refractory period can be clearly demonstrated on the auricle of the experimental animal. The predominant

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4. Brodie, B. B.; Lief, P. A., and Poet, R.: The Fate of Procaine in Man Following its Intravenous Administration and Methods for the Estimation of Procaine and Diethylaminoethanol, J. Pharmacol. and Exper. Therap. 94: 359, 1948.

5. Rosenberg, B.; Kayden, H. J.; Lief, P. A.; Mark, L. C.; Steele, J. M., and Brodie, B. B.: Studies on Diethylaminoethanol: I. Physiological Disposition and Action on Cardiac Arrhythmias, J. Pharmacol. and Exper. Therap. 95: 18, 1949.

6. Mark, L. C.; Berlin, I.; Kayden, H. J.; Rovenstine, E. A.; Steele, J. M.; and Brodie, B. B.: The Action of Procaine Amide on Ventricular Arrhythmias, J. Pharmacol. and Exper. Therap. 98: 21, 1950.

distribution of the sympathetic innervation is on ventricular rhythmic foci,[7] which suggests that procaine amide may exert its effect by a sympathetic blocking action. It has been demonstrated that the related compound diethylaminoethanol has potent sympatholytic action.[8]

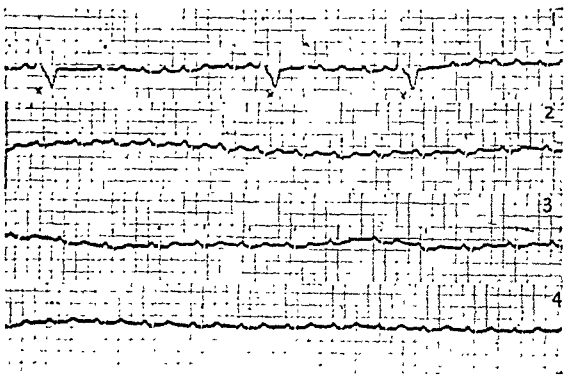

Fig. 2.—Electrocardiogram of patient M. S., a woman 45 years of age, who had frequent and persistent extrasystoles and one or two attacks of paroxysmal tachycardia daily for six months. During this period she was never free of consciousness of the heart beat for more than 3 or 4 seconds. After 400 mg. of procaine amide by vein, there was abolition of the premature beats with complete disappearance of the subjective sensations in the chest. Strip one shows the ventricular extrasystoles, strip 2, 3 and 4 taken two, ten and thirty minutes after the injection of the drug. The arrhythmia was almost completely controlled by the oral administration of 500 mg. three times a day.

Our reliance on the therapy of ventricular ectopic beats and rhythms has been almost entirely limited to the use of quinidine. Although this drug has been a great addition to cardiac therapeutics, it may at times fail to act. In two patients who were relieved of a ventricular tachycardia by procaine amide, previous administration of quinidine in adequate dosage had been ineffective. In emergencies such as prolonged exhausting attacks of ventricular tachycardia, the administration of quinidine by vein has been followed by severe reactions and an occasional fatal outcome. Procaine has been used effectively by vein in the therapy of ectopic ventricular rhythms. Although precautions in the mode of administration have reduced unfavorable reactions, unpredictable toxic effects may occur. Rovenstine and Popper[9] state "that effective intravenous procaine medication can be had by an amount of the drug that continuously provides mild toxic manifestations." They point out that more serious reactions may occur. Reactions to intravenous procaine amide were mild and infrequent. Occasionally, the patient complained of a bitter taste during the injection, and at times there was a flushing of the face. A moderate hypotensive effect was observed in some patients. In two patients with ventricular tachycardias a more marked drop in blood pressure was noted. It is possible that this reaction can be avoided by a slow injection of the drug. At the onset of our studies, the drug was injected at a slow rate. Since no untoward reactions were observed, the speed of administration was gradually increased. This rapider injection appeared to be well tolerated. Kayden[10] feels that the possibility of reactions may be reduced by a slower administration and suggests that the drug be injected at a rate of 200 mg. a minute. Since we have seen no definite advantage in a rapider rate, it would seem that the slower injection may be desirable. No hypotensive effects were observed after oral administration. Occasionally, mild to moderate gastric discomfort was noted, and three patients complained of a sense of "tension and jitteriness" while on maintenance doses of procaine amide by mouth.

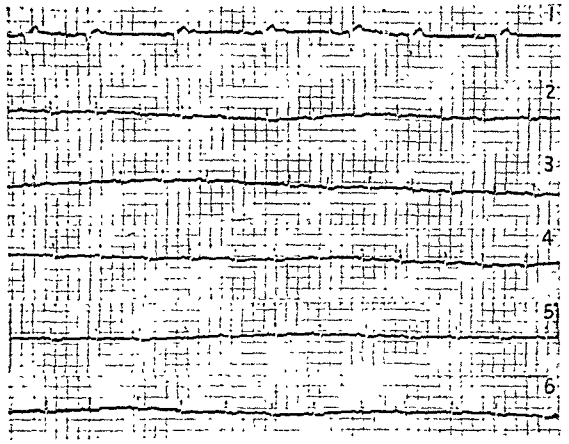

Fig. 3.—Electrocardiogram of patient S. S. Strip 1 shows a bigeminal rhythm, which was due to overdigitalization. Strips 2, 3, 4, 5 and 6 taken during, and five, ten, twenty and thirty minutes after, the intravenous administration of 500 mg. of procaine amide. Oral administration of 500 mg. of the drug every four hours controlled the arrhythmia.

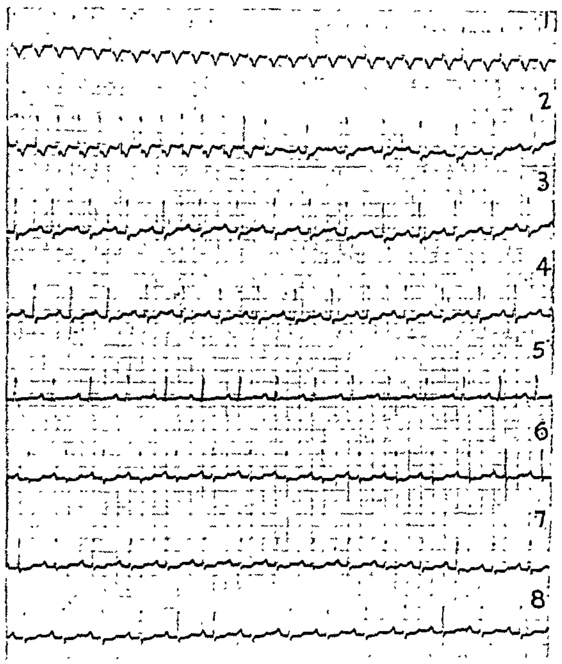

Fig. 4.—Electrocardiogram of patient F. Y. Strip 1 shows a supraventricular tachycardia, rate 184. Strip 2, taken during the intravenous injection of 500 mg. of procaine amide, shows the restoration of sinus rhythm. Lower strips taken one, five, ten, fifteen, twenty and sixty minutes after the administration of the drug.

Further experience may modify the clinical applications and the optimum dosage of the drug. For the present, it would appear that the drug is indicated in the therapy and prevention of ectopic beats and ectopic tachycardias. This includes the application of the drug in the prevention and therapy of arrhythmias occurring

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7. Nathanson, M. H.: The Rhythmic Property of the Human Heart, Arch. Int. Med. 72:613 (Nov.) 1943.

8. Freis, E. D.; Stanton, J. R., and Moister, F. C.: Sympatholytic Effects of Diethylaminoethanol in Man, Proc. Soc. Exper. Biol. and Med. 71:299, 1949.

during anesthesia, especially in patients who require thoracic surgery. It would seem justifiable to use the drug routinely after a coronary thrombosis, in order to prevent serious arrthythmias, including ventricular fibrillation. It is now known that varying degrees of ventricular acceleration and ventricular fibrillation may be the basis of the Adams-Stokes attacks in heart block. No effective drug has been suggested for such attacks, but procaine amide appears to be indicated. The effectiveness of the drug in these situations must be determined by further observation.

As to the mode of administration and dosage, it appears that most arrhythmias can be controlled by the oral administration of the drug. For patients with prolonged attacks of ventricular tachycardia, it may be advisable to administer the drug by vein. Orally, the dose varies from 0.5 Gm. three times a day to 1.0 Gm. every three or four hours. Intravenously, a dose of 0.5 Gm. may be injected slowly and the response noted by observation of the heart rate or, preferably, by the electrocardiogram. If the ectopic rhythm persists or the heart rate is not effectively reduced, an additional 0.5 Gm. may be injected. Blood pressures should be recorded and the injection discontinued if a marked hypotensive reaction occurs. It should be pointed out that a definite reduction of the ventricular rate to 110 to 120, without restoration of sinus rhythm, may in some instances be considered a satisfactory response. The slower rate, although still idioventricular in origin, lessens the danger of cardiac or circulatory failure.

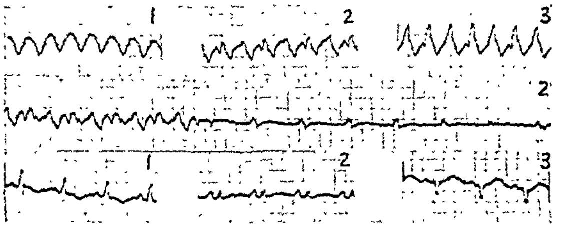

Fig. 5.—Electrocardiogram of patient L. M. Upper strips are leads 1, 2 and 3 showing a ventricular tachycardia, rate 160. This record was taken when the attack had been present for 18 hours, during which time the patient had received 400 mg. of quinidine sulfate orally every two hours. The middle strip shows the cessation of the ventricular rhythm, one minute and fifteen seconds after an intravenous injection of 500 mg. of procaine amide. The auricular waves are absent at this time but appear in the record taken an hour later, the lower strips.

The duration of the effect of an intravenous administration of the drug was variable. In some patients occasional premature systoles appeared within six or seven minutes. In other instances the extrasystoles were absent after two hours of observation. It is probable that the duration of the normal rhythm is not related to the duration of the actual pharmacological action of the drug. Premature systoles and ectopic tachycardias have been ascribed to several mechanisms, and under different circumstances several factors may be operative. Clinical experience in the therapy of cardiac arrhythmias indicates that a drug may alter the abnormal mechanisms causing an arrhythmia and that the restored normal cycle of events in the heart persists after the drug action has subsided. It is not the rule for a therapeutically terminated ectopic tachycardia to recur when the effective mechanism has ceased to act. As illustrations, carotid sinus pressure or the injection of methacholine (mecholyl®) for supraventricular tachycardias have a brief physiological action, but if sinus rhythm is induced, it usually persists.

SUMMARY

Procaine amide was administered intravenously to 55 patients with various cardiac arrhythmias.

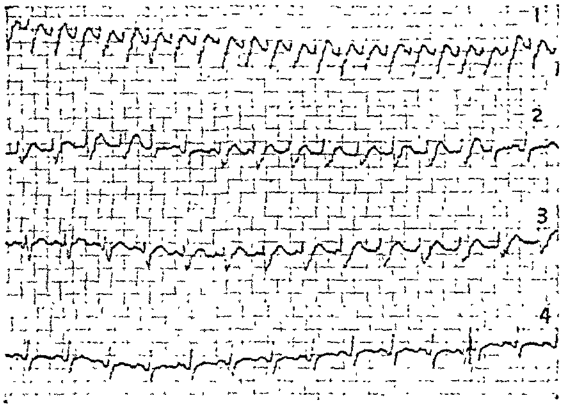

Fig. 6.—Electrocardiogram of patient A. S. Strip 1 shows a ventricular tachycardia, rate 164. Strip 2, taken after an intravenous injection of procaine amide, 500 mg., shows a rate of 114. Strip 3, taken after 800 mg. of procaine amide was administered, shows a rate of 100. Strip 4, taken after 1 Gm. of procaine amide shows sinus rhythm, rate 94.

Ectopic ventricular beats were usually abolished within one minute after the drug was injected.

Sinus rhythm was restored in three out of four attacks of supraventricular tachycardia.

Of eight attacks of ventricular tachycardia, normal rhythm was restored in four, and in four instances the ventricular rate was effectively reduced.

Sinus rhythm was restored in one instance of paroxysmal auricular fibrillation. In 11 patients with chronic auricular fibrillation, normal rhythm was not established. In six patients with auricular fibrillation and frequent ventricular extrasystoles, the ectopic beats were abolished and the auricular rhythm unaffected.

It was demonstrated that arrhythmias could be controlled by oral administration of the drug.

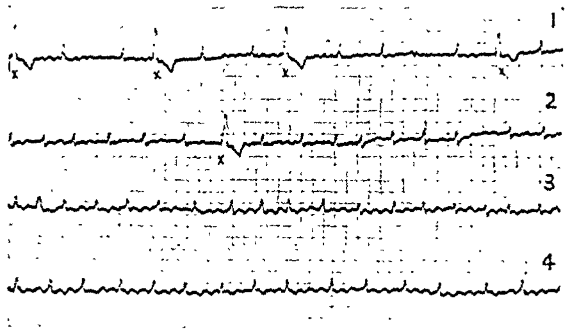

Fig. 7.—Electrocardiogram of patient D. A. Strip 1 shows auricular fibrillation and frequent ventricular extrasystoles. Strip 2, taken immediately after the intravenous injection of 500 mg. of procaine amide, shows only one extrasystole. Extrasystoles are absent in strips 3 and 4, which were taken five and ten minutes later, and were absent during an observation of one hour. The auricular fibrillation is seen to have persisted, but there is a slowing and widening of the fibrillation waves (strips 3 and 4).

The drug was well tolerated, and untoward reactions were infrequent and of a mild nature.

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9. Rovenstine, E. A., and Papper, E. M.: The Therapeutic Role of Procaine and its Derivatives, Bull. New York Acad. Med. 25:298, 1949.
10. Kayden, H. J.: Personal communication to the author.

DIGITALIS IN ACUTE MYOCARDIAL INFARCTION

John Martin Askey, M.D., Los Angeles

This study is concerned with the question: Does digitalis in therapeutic amounts increase the incidence of ectopic rhythms in the presence of myocardial infarction? The lack of a convincing answer is responsible for an unusual therapeutic paradox. Largely because of fear of induction of dangerous ectopic ventricular rhythms, digitalis, the most efficacious drug known for congestive heart failure, is given hesitantly for the congestive heart failure associated with myocardial infarction. The evidence that therapeutic doses of digitalis cause ventricular ectopic arrhythmias in the human with myocardial infarction is not convincing. The data presented largely comprise sporadic instances of arrhythmias associated with the use of the drug, which can be ascribed as logically to the coincidental use as to the effect of the drug. Clinical observations have been usually without an adequate control series.

Opinions as to the proper use of digitalis in myocardial infarction vary almost with the individual. One can find good authority for fearing digitalis or for not fearing it; for using it for early congestive failure or for using it only if the failure is progressive; for avoiding digitalis in certain stages or for using it at any stage; for giving small doses because of a supposed diminished tolerance or for giving digitalis in large doses intravenously because such patients respond only to large doses.[1] A recent report by Gilson and Schemm [2] of four cases in which paroxysmal ventricular tachycardia occurring in association with myocardial infarction disappeared after the administration of digitalis indicates the need for reexamining the role of the drug.

This paper is a study of the arrhythmogenic effect of a therapeutic dose of digitalis as determined in two groups of patients with proved myocardial infarction. They were similarly treated save for one variable: One group received digitalis.

MATERIAL

Over a period of several years alternate patients with myocardial infarction, proved by typical electrocardiographic patterns, have been given digitalis. This is a study of the first 100 patients.

To make the study more definitive, patients with serious complications were excluded. It was felt that an arrhythmogenic effect of digitalis upon an area of myocardial necrosis could be evaluated better in the absence of complications than in their presence. Patients moribund, in severe shock, or in obvious congestive failure on admission were excluded. Patients who had been receiving digitalis or quinidine prior to the attack were excluded. Those with any history of an arrhythmia prior to the infarct were excluded. If an arrhythmia was present at the onset, the patient was arbitrarily considered to have had the arrhythmia before the myocardial infarction, since in most instances it could not be proved otherwise. The group studied, therefore, comprised patients with proved myocardial infarction who were not apparently in any immediately critical condition. In all instances administration of the drug was started in the first week after the attack. Digitoxin was given in 0.2 mg. doses three times daily for two days and then 0.2 mg. once daily for the remainder of the hospital stay. Since the average stay was more than three weeks, the patients received digitoxin for more than two weeks. Digitoxin was given slowly because of studies indicating a lower requirement in myocardial infarction.[3] The first 16 patients were treated without bishydroxycoumarin, of whom 8 received digitalis; the remaining 84 patients received the drug during the hospital stay.

The period of study was the period of the hospital stay, or slightly less than four weeks. The objective criteria for evaluating the effect of digitalis, as defined at the outset of the study, were the number of deaths, the number of sudden deaths, and the frequency of disturbances of rate and rhythm. The heart of each patient was auscultated several times daily. Any disturbance in rate or rhythm was checked by electrocardiogram. It is important to know the length of time the heart is examined when one is evaluating the incidence of premature beats. In most cases it was a rule to listen for two minutes. Although admissible that occasional premature beats may have been missed owing to the small fraction of the 24 hr. covered, any error should apply equally to the two groups.

UNDERLYING HEART DISEASE

The two groups seemed to be comparable so far as the degree of underlying heart damage was concerned. The groups were analyzed as to age, sex, previous hypertensive cardiovascular disease, history of anginal pain prior to a month before the attack, or history of previous cardiac infarction. The ages ranged in one group from 45 to 85, and in the other from 39 to 82. The average age was 60.2 years in one group and exactly 60 in the other. The incidence of previous cardiovascular disease as evaluated from the history and examination was essentially the same in each group. A history of previous hypertensive cardiovascular disease, of anginal symptoms, or of previous episodes of cardiac infarction was obtained in 32 per cent of one group and in 34 per cent of the other. Despite the small number in each group, the distributions of these findings were remarkably similar (table 1).

From the Department of Medicine of the School of Medicine of the University of Southern California, and St. Vincent's Hospital.

Drs. C. R. Stephenson, W. C. Goodwin, J. E. Meihaus, A. C. P. Bakos, C. B. Cherry, and A. F. Edwardes assisted in this study.

[1] Askey, J. M.: Present Status of Digitalis in Therapy of Myocardial Infarction, Ann. West. Med. & Surg. **2**: 66 (Feb.) 1948.

[2] Gilson, J. S., and Schemm, F. R.: The Use of Digitalis in Spite of the Presence of Ventricular Tachycardia, Circulation **2**: 278 (Aug.) 1950.

[3] (*a*) Travell, J.; Gold, H., and Modell, W.: Effect of Experimental Cardiac Infarction on Response to Digitalis, Arch. Int. Med. **61**: 184 (Feb.) 1938. (*b*) Bellett, S.; Johnston, C. G., and Schecter, A.: Effect of Cardiac Infarction on the Tolerance of Dogs to Digitalis: Experimental Study, ibid. **54**: 509 (Oct.) 1934.

If one allows for the instances in which two conditions occurred in the same patient, there were 62 patients of the 100 in whom there had been previous infarction, previous hypertension, or previous angina. Our criteria for hypertension were blood pressure values over 150/90 on examination or a definite history of preexisting hypertension. The incidence of hypertension is lower than the percentage in an unselected group [4] (36 to 46 per cent), as would be expected.

EARLY CONGESTIVE FAILURE

Although obvious congestive failure was not present in any patient, findings suggesting early congestive failure were equally distributed in the two groups. The data necessary to make such a diagnosis in the presence of myocardial infarction are controversial. If a prolonged circulation time (more than 16 sec. from arm to tongue) is accepted as evidence of early left ventricular failure, the majority were in early congestive failure. Basal râles in the lungs were mentioned in about half of the patients in each of our groups studied. These findings are in accord with those of Selzer,[5] who found that patients with acute myocardial infarction had both a prolongation of the circulation time and a concomitant reduction in the vital capacity.

There is other evidence that pulmonary congestion occurs in most instances of myocardial infarction. Massie and Miller [6] examined the chests of 16 patients with myocardial infarction by X ray within 24 hr. of the acute attack. There was roentgenologic evidence of pulmonary congestion in 12 of the 16 patients, but only 7 of the patients had basal lung râles. Absence of lung râles does not rule out pulmonary congestion.

CIRCULATION TIME

Arm-to-tongue circulation times were determined with dehydrocholic acid (decholin®) on 54 patients during the first week. In only 10 of the 54 were times under 16 sec. recorded. In the majority they ranged between 20 and 30 sec. In 31 patients a second determination was made after one week. A group of 17 patients who were given digitalis at the onset of the attack had an average circulation time of 25 sec. at the onset. One week later the circulation time was 18 sec. A group of 14 patients who received no digitalis had an average circulation time of 22 sec. at the onset and 17 sec. after one week.

RESULTS

The results for the two groups are remarkably similar (table 2). The low mortality rate, 8 per cent (in a private hospital where the over-all mortality rate is around 20 per cent), is a reflection of a selected group, free from complications. The slight difference in the number of deaths and in the incidence of sudden death is probably insignificant. Among the first 16 patients who received no bishydroxycoumarin, there was one death in the group that received digitalis and one death in the group that received no digitalis.

The incidence of auricular fibrillation and of auriculoventricular conduction defects is within the expected range. A number of arrhythmias were present at the onset of the attack and were excluded. Two patients on admission had complete auriculoventricular heart block, two had auricular fibrillation, and seven had ventricular premature beats. The elimination of those patients who showed premature beats at the onset of the attack probably removed from the study a large percentage of those in whom ectopic contractions would develop from the effect of the cardiac infarction alone. Experimentally, ectopic beats develop immediately or within eight hours in animals whose coronary arteries are ligated.[7] It is probable that the above excluded arrhythmias present at the onset resulted from the myocardial infarction, but it could not be proved that they were not present before. The preponderance of the ventricular ectopic beats in the group receiving no digitalis was surprising. There were four instances of ventricular premature beats; in two instances there occurred runs of three or more ectopic beats, the initial stage of ventricular paroxysmal tachycardia. Normal sinus rhythm returned in both instances after a few injections of quinidine, and both patients survived. In the single patient in whom ventricular premature beats developed among the 50 who received digitalis, occasional ectopic beats occurred after three weeks just prior to discharge from the hospital.

TABLE 1.—*Distribution of Different Factors in the Two Groups*

				Percentage of Patients with		
	No. of Patients	Average Age, Yr.	Sex *	Previous HCVD †	History of Angina	Previous Infarction
Without digitalis..	50	60.2	72	28	16	20
With digitalis......	50	60	70	28	24	16

* The values represent the percentages of males.

† HCVD indicates hypertensive cardiovascular disease.

TABLE 2.—*Numbers of Deaths and Arrhythmias in Patients with Acute Myocardial Infarction*

					Arrhythmias		
	Patients	Deaths	Sudden Deaths	Auricular Fibrillation	A. V. Block	Ventricular Premature Beats *	Incipient Ventricular Paroxysmal Tachycardia
Digitalis given.	50	3	2	3	2 (partial)	1	0
No digitalis....	50	5	3	2	1 (partial)	2	2 †

* One patient given digitalis had occasional auricular premature beats. One patient receiving no digitalis had an occasional auriculoventricular nodal premature beat.

† Runs of three or more premature beats.

COMMENT

With the limited clinical material available it has taken over three years to observe 100 cases, too small a number to allow inductive conclusions. It does represent,

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4. Doscher, N., and Poindexter, C. A.: Myocardial Infarction Without Anticoagulant Therapy, Am. J. Med. 8: 623 (May) 1950.

5. Selzer, A.: Circulation in Acute Myocardial Infarction, Arch. Int. Med. 76: 54 (July) 1945.

6. Massie, E., and Miller, W. C.: The Heart Size and Pulmonary Findings During Acute Coronary Thrombosis, Am. J. M. Sc. 206: 353 (Sept.) 1943.

7. Smith, F. M.: The Ligation of Coronary Arteries with Electrocardiographic Study, Arch. Int. Med. 22: 8 (July) 1918. Harris, A. S.: Delayed Development of Ventricular Ectopic Rhythms Following Experimental Coronary Occlusion, Circulation 1: 1318 (June) 1950.

however, an attempt at a carefully controlled clinical study. Certain significant facts developed from the study.

Fifty patients with proved myocardial infarction were given digitalis in effective doses without development of any dangerous ventricular rhythms. These results are contrary to what was expected, based on the experimental work on animals and the opinions of clinicians. If digitalis increases the excitability of the necrotic myocardial focus, it theoretically should have increased the incidence of ectopic ventricular rhythms. In this study the group that received digitalis actually had fewer ventricular premature beats. It cannot be deduced from the small series that this difference is significant. The results, however, emphasize the need for the reexamination of the role of digitalis in the presence of myocardial infarction.

The evolution of the fear of digitalis in myocardial infarction has been gradual. In Herrick's [8] original classic paper of 1912, he advocated the routine use of digitalis. Hamman [9] in 1926 said: "The patient should be promptly and fully digitalized. . . .Not only is the digitalized heart better prepared to withstand the added burden of certain arrhythmias should they come on, but it is also stimulated to put forth its best efforts. How desirable the best efforts may be when a large area of heart muscle is infarcted, needs no further comment." Gradually reports of ventricular paroxysmal tachycardia resulting from excessive amounts of digitalis appeared. Since both myocardial infarction and digitalis in toxic doses were capable of inducing the hazardous arrhythmia, digitalis in smaller dosage was assumed to have an additive effect if given in the presence of cardiac infarction. Experimental work done on animals [3] following ligation of coronary vessels showed that only three-fourths as much digitalis was required to cause a ventricular ectopic rhythm and death as in the normal animal. Other work indicated a lessened tolerance of the heart to digitalis after experimental infarction.[3b] The resultant caution advised in the use of digitalis was interpreted by many as a reasonable indication for using the drug only for desperate situations. As Levine [10] expressed it, "It is this very vulnerability of the heart to digitalis in coronary artery disease and coronary thrombosis that, among other conditions, has militated against its use in those conditions." These animal studies, however, are only evidence of a lower lethal dose of digitalis in the presence of myocardial infarction. There has been no study made of the effect of varying doses of digitalis upon the incidence of ventricular premature beats which occur following ligation of a main coronary artery in animals.

The precise place for the use of digitalis needs further elucidation. It is questionable if the results derived from experiments on animals with normal arteries and hearts and under abnormal conditions can be applied to man without more critical appraisal. It is questionable if animal experiments can answer adequately the questions and solve the problems that confront the clinicians. The ultimately significant data must be logically obtained from observation of the effect of digitalis on man who has suffered a spontaneous myocardial infarction. Such data must be of sufficient amount to permit statistical analysis. The role of digitalis could best be determined by some mass study such as led to the rapid elucidation of the role of bishydroxycoumarin in the treatment of myocardial infarction. Such studies are the joint responsibility of many qualified institutions.

Until such studies are completed, I feel justified in using digitalis more freely in the presence of myocardial infarction. Instead of following the common advice to use digitalis only if congestive failure is progressive, or to withhold it until unmistakable signs of both right and left ventricular failure are present, it would seem wiser to administer the drug for the early signs and symptoms. Basal lung râles probably should not be regarded as transitory unimportant findings, but should be routinely supported by other data such as determination of the circulation time and of the vital capacity. If early left ventricular failure is suspected to be present, there is no evidence in this study to support a policy of withholding digitalis until signs of marked failure appear.

The recent report of Schemm [11] would indicate that the profession has been failing to take full advantage of a valuable drug. Thoreau said, "It is never too late to give up our prejudices. No way of thinking, however ancient, can be trusted without proof."

SUMMARY

In a group of 50 patients with proved myocardial infarction and no obvious complications, the administration of digitalis in therapeutic amounts, started in the first week and continuing throughout the hospital stay, induced no more ventricular ectopic rhythms or instances of sudden death than occurred in a control group of 50 treated without digitalis.

Without further evidence the fear of catastrophic arrhythmias should not be cited as a deterrent to the use of average doses of digitalis for the early signs and symptoms of congestive heart failure in myocardial infarction.

[8] 8. Herrick, J. B.: Clinical Features of Sudden Obstruction of the Coronary Arteries, J. A. M. A. 59: 2015 (Dec. 7) 1912.

[9] 9. Hamman, L.: The Symptoms of Coronary Occlusion, Bull. Johns Hopkins Hosp. 38: 273 (April) 1926.

[10] 10. Levine, H. D.: Abnormal Rapid Rhythms Associated with Digitoxin Therapy, Ann. Int. Med. 29: 822 (Nov.) 1948.

[11] 11. Schemm, F. R.: Digitalis in Cardiac Disease Without Congestive Heart Failure or Auricular Fibrillation, Postgrad. Med. 7: 385 (June) 1950.

Striving Toward Better Methods.—Prof. John Dewey's definition of a good man is a man who is constantly getting better. This is particularly applicable to the definition of a good doctor, namely, one who is constantly getting better. Medicine itself is improving by the day, and woe betide the doctor who stands still, because medicine is moving so fast that he is soon left behind. You have got to keep swimming or you will sink. The great trouble with the devotees of cults in the healing art is that they profess to have found the true and only way to heal the sick. They are shackled by their creeds, and stagnate in fundamentalist doctrines. Whereas regular medicine, dissatisfied with its limitations, is constantly striving toward better methods of preventing sickness and healing the sick.—Conrad Wesselhoeft, M.D., Some Remarks on the Privilege of Practicing Medicine, *The Diplomate*, February 1951.

RS-T SEGMENT, T WAVE AND HEART RATE AFTER TWO STEP AND 10 PER CENT ANOXEMIA TESTS

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The Master "two step" test and the anoxemia test of Levy are accepted as useful objective tests in the diagnosis of coronary artery disease.[1] These tests are particularly valuable in those cases in which coronary artery disease is suspected, but clinical examination and resting electrocardiogram are negative. In both procedures, the first by means of standardized exercise, the second by inhalation of a 10 per cent oxygen mixture, relative anoxemia of the myocardium is produced, which in persons with heart disease will be most frequently revealed by certain abnormal electrocardiographic findings—each test having its own criteria for an abnormal response.

Since abnormal electrocardiographic changes may occur in normal persons subjected to excessive exercise,[2] and negative tracings may result in persons with coronary disease if the exercise is insufficient, the exercise employed in the two step test has been standardized for age, weight and sex. The criteria for an abnormal electrocardiographic response in this test are:

1. Depression of the RS-T segment below the isoelectric level (P-R level) of more than 0.5 mm. in leads 1, 2 or 4.
2. Change from an upright T wave to an isoelectric or inverted T wave (or change in T wave in the opposite direction).
3. Presence of arrhythmia immediately after exercise, which was not present before exercise, and which reverts to normal, e. g., A-V block.

The Levy anoxemia test is based on the inhalation of a mixture of 10 per cent oxygen and 90 per cent nitrogen that is passed through water. Flutter valves are incorporated in the apparatus, so that rebreathing is avoided. A tank of 100 per cent oxygen is incorporated in the circuit, so that oxygen can be administered quickly if needed. Levy's criteria for a positive test are:

1. The sum of the RS-T deviations in leads 1, 2, 3 and 4 F should be greater by 3 mm. or more than in the control tracing.
2. Partial or complete reversal of the direction of the T wave in lead 1, accompanied by RS-T deviation of 1 mm. or more in this lead.
3. Complete reversal of the direction of the T wave in lead 4 F regardless of any associated RS-T deviations in this lead.

In the routine two step test resting control electrocardiographic tracings are taken with limb leads and all chest leads from 1 to 6. Tracings using the three limb leads and the chest V_4 position are recorded immediately after exercise and again at the end of two minute and six minute intervals. If these tracings do not return to normal limits, another electrocardiogram is made at the end of 10 minutes.

In the routine anoxemia test a resting electrocardiogram is made as a control. Tracings are taken at five minute intervals during inhalation of the 10 per cent oxygen-nitrogen mixture, then one minute after inhalation of 100 per cent oxygen and again five minutes after breathing room air.

METHOD

For this study the Master two step test and the Levy anoxemia test were carried out on 23 patients who had normal resting electrocardiograms but histories of precordial pain of varying degrees of severity. To permit detailed comparison of the results of the two tests, tracings were taken at one minute intervals for 10 minutes after exercise and at one minute intervals for 20 minutes during the anoxemia test. Our purpose was to compare heart rate, RS-T segments and T waves at various time intervals and to determine whether or not changes, if occurring during the 10 per cent anoxemia test, corresponded at any time interval to changes observed following the two step exercise test. Since in both tests the criteria are based chiefly on RS-T deviations and T wave changes, changes in the P wave and Q, R and S deflections were not considered of importance for this study. In all cases the tests were given on different days but within a day or two of each other and under as nearly similar conditions as could be obtained. In the two step test use of the Sanborn cardiette® made it possible to complete the electrocardiogram within 30 to 40 seconds after exercise. All records before and after exertion were made with the patient recumbent in bed. The isoelectric reference point for RS-T deviations was the P-R level, and the depression of the RS-T segment was measured from this base.

Table 1 shows the incidence of sex and age distribution in the series of 23 patients. All these patients were ambulatory.

In table 2 a comparison of the heart rate immediately following the two step exercise test and the heart rate at the end of the longest period of inhalation of 10 per cent oxygen in the anoxemia test is given. The latter period was 20 minutes except in those cases in which the test

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Research Assistant, Cardiographic Laboratory, Mount Sinai Hospital (Dr. Storch); Cardiologist and Chief of the Cardiographic Laboratory, *Mount Sinai Hospital* (Dr. Master).

[1] (*a*) Master, A. M., and Oppenheimer, E. T.: A Simple Exercise Tolerance Test for Circulatory Efficiency with Standard Tables for Normal Individuals, Am. J. M. Sc. **177**: 223, 1929. (*b*) Master, A. M.: The Two-Step Test of Myocardial Function, Am. Heart J. **10**: 495, 1935. (*c*) Levy, R. L.; Williams, N. E.; Bruen, H. G., and Carr, H. A.: The "Anoxemia Test" in the Diagnosis of Coronary Insufficiency, Am. Heart J. **21**: 634, 1941. (*d*) Patterson, J. E.; Clark, T. W., and Levy, R. L.: A Comparison of Electrocardiographic Changes Observed During the "Anoxemia Test" on Normal Persons and on Patients with Coronary Sclerosis, Am. Heart J. **23**: 837, 1942. (*e*) Weintraub, H. J., and Bishop, L. F., Jr.: Anoxemia Test for Coronary Insufficiency, Ann. Int. Med. **26**: 741, 1947. (*f*) Twiss, A., and Sokolow, M.: Angina Pectoris: Significant Electrocardiographic Changes Following Exercise, Am. Heart J. **23**: 498, 1942. (*g*) Grossman, M.; Weinstein, W. W., and Katz, L. N.: The Use of the Exercise Test in the Diagnosis of Coronary Insufficiency, Ann. Int. Med. **30**: 387, 1949. (*h*) Puddu, V., and Massafia, A.: Considérations sur l'épreuve electrocardiographique d'effort, Acta cardiol. **2**: 340, 1947.

[2] Feil, H., and Pritchard, W. H.: The Electrocardiogram of Anginal Attacks Induced by Exercise, Mod. Concepts Cardiovas. Dis., April 1946, vol. 15.

had to be stopped. In table 2 will also be found the most rapid heart rate observed during the tests in each case and also the positive and negative responses. The results are correlated with age, sex and previous clinical diagnosis. The most rapid heart rate in the two step exercise test was present in the electrocardiogram taken immediately after exertion except in two cases. In these the heart rate was most rapid at the end of one minute after exercise; thereafter it dropped quickly to the resting level. In the anoxemia test no correlation was found between the period of anoxemia and the heart rate. The heart rate generally increased with the duration of anoxemia but not as much as it did in the two step exercise test. Furthermore, in some patients the heart rate fluctuated considerably during the entire period of anoxemia. The heart rate was most rapid during the first 10 minutes in 17 of the 23 patients. In 10 instances the heart rate was highest during the first five minutes. Not at any time was there correlation between the heart rate during periods of anoxemia and the heart rate after exercise. This was true when the results of the two tests were the same and also when they differed. It should be noted however that four of the negative anoxemia tests were stopped before the full 20 minute period of anoxemia, two were discontinued at 18 minutes, one at 12 minutes and one at eight minutes. Three of the positive anoxemia tests were stopped at 11, five and three minutes respectively. Even in these seven tests that were suspended before the full 20 minutes had elapsed the most rapid heart rate was present at the longest period of anoxemia in but two instances, one a negative and one a positive test.

TABLE 1.—*Age and Sex Distribution*

		Sex	
Age, Yr.	No. of Cases	Male	Female
21-30	2	1	1
31-40	1	1	0
41-50	5	3	2
51-60	9	7	2
61-70	6	6	0
Totals	23	18	5

In table 3 is a comparison of the maximum RS-T segment depression in each lead with the time interval at which this depression appeared during the test. It is important to note that the depression of the RS-T segment was measured from the isoelectric base line (P-R level). In the exercise test RS-T segment depressions appeared most frequently in lead 2, then in leads 1, 3 and 4 in that order. The deepest RS-T segment depressions, however, appeared in lead 4, then in leads 2, 1 and 3 in that order.

In the anoxemia test no correlation was present between the degree of RS-T segment depression and the period of anoxemia, nor could any correlation be made between the period of anoxemia and the time interval following the two step exercise test with regard to RS-T segment depression. The anoxemia test thus differed from the two step exercise test, in which 95 per cent of the maximum RS-T segment depressions appeared in the tracing made immediately after exercise.

The maximum RS-T depression, like the maximum heart rate, when present in the two step test, occurs in the tracing recorded immediately after exercise in the great majority of patients. Analyzing each of the standard limb leads and the chest 4 position, the following is found:

Lead 1: All the maximum RS-T depressions occurred in the tracing taken immediately following exercise.

Lead 2: All the maximum RS-T depressions occurred in the tracing immediately after exercise.

Lead 3: In case 10, a negative test, the greatest RS-T segment depression occurred in the five minute tracing. In the others the greatest RS-T depression was in the immediate recording.

Lead 4: In case 20 the greatest depression occurred in the two minute tracing. In the others the maximum RS-T depressions occurred in the immediate tracing.

In the tracings taken immediately after exercise when RS-T segment depressions of over 0.5 mm. occurred they were present in lead 1 in 89 per cent of the cases, in lead 2 in 100 per cent, in lead 3 in 71 per cent and in lead 4 in 71 per cent. However, the lead that showed the deepest RS-T segment depressions was lead 4, then leads 2, 1 and 3 in that order.

Analysis of depression of the RS-T segment in the anoxemia test shows the following results:

Lead 1: In three positive cases the maximum RS-T segment depressions occurred at 20 minutes (case 13); two minutes (case 14), and at two minutes (case 15).

Lead 2: In five positive anoxemia tests the maximum RS-T segment depressions appeared at 20 minutes (case 13); four minutes (case 14); two minutes (case 15); 11 minutes (case 16), and at 10 minutes of anoxemia (case 17).

Lead 3: In two positive cases the maximum RS-T depressions appeared at two minutes (case 14), and at 15 minutes (case 16).

Lead 4: In three positive cases the greatest RS-T segment depressions appeared at 20 minutes (case 13); three minutes (case 15), and at nine minutes (case 17).

Again it is to be noted that even in those cases where the test was discontinued the maximum RS-T segment depressions were not always present at the longest period of anoxemia.

Table 4 shows in each lead the height of the T wave in the immediate tracing of the exercise test and at the longest period of anoxemia in the anoxemia test (which was at the 20 minute period unless the test had to be suspended).

Analysis of the table shows that, as has been generally thought, the T wave is reduced in height after exercise or anoxemia.[3] However, this reduction did not occur in all cases in this study. In fact, the T wave in lead 3 became taller in 52 per cent of the cases in the tracing immediately after exercise. In addition, in lead 4 the number of cases that showed heightening of the T wave and lowering of the T wave was the same.

In the two step test the T wave in the tracing made immediately after exercise changed as follows:

Lead 1: In 52.2 per cent of the cases the T wave became smaller; in 13 per cent of the cases it became taller, and in 34.8 per cent it remained unchanged.

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[3] (*a*) Baum, W. S.; Malmo, R. B., and Sievers, R. F.: A Comparative Study of the Effects of Exercise and Anoxia upon the Human Electrocardiogram, J. Aviation Med. **16**: 422, 1945. (*b*) Biörck, G.: Anoxemia and Exercise Tests in the Diagnosis of Coronary Disease, Am. Heart J. **32**: 689, 1946.

Lead 2: In 52.2 per cent of the cases the T wave became smaller; in 17.4 per cent of the cases it became taller, and in 30.4 per cent it remained unchanged.

Lead 3: In 17.4 per cent of the cases the T wave became smaller; in 52.2 per cent of the cases it became taller, and in 30.4 per cent it remained unchanged.

Lead 4: In 39.1 per cent of the cases the T wave became smaller; in 39.1 per cent of the cases it became taller, and in 21.8 per cent of the cases it remained unchanged.

In none of the 23 cases was a positive exercise test based solely on T wave changes. In those cases in which abnormal T wave responses did occur there were also abnormal RS-T segment alterations (cases 13, 14 and 15).

TABLE 2.—*Comparison of the Heart Rate Immediately Following Exercise and at Period of Greatest Anoxemia, Showing the time at which the Maximum Heart Rate Appeared in Each Test*

Case	Sex	Age, Yr.	Result Tests: 2 Step	Result Tests: 10% Oxygen	Heart Rate: Immed. After 2 Step	Heart Rate: Period of Greatest Anoxemia	Time of Appearance of Maximum Heart Rates: 2 Step: Rate	2 Step: Time	Anoxemia *: Rate	Anoxemia *: Time, Min.	Diagnosis
1	M	35	—	—	130	75	130	Immed.	80	1	Normal adult
2	F	41	—	—	75	76	75	Immed.	100	2	Normal adult
3	M	25	—	—	118	100	118	Immed.	115	14	No heart disease; diabetes mellitus
4	M	46	—	—	120	80	120	Immed.	80	4	Normal adult
5	M	67	—	—	110	80	110	Immed.	80	10	No heart disease; chronic bronchitis with hypertrophic emphysema
6	M	46	—	—	100	80	100	Immed.	80	15	Normal adult
7	M	52	—	—	100	95	100	Immed.	95	20	Normal adult
8	M	52	—	—	125	78	125	Immed.	93	5	Normal adult
9	F	52	—	—	75	106 †	78	1 min.	106	12	Normal adult
10	M	54	—	—	92	56	92	Immed.	64	3	Normal adult
11	M	55	—	—	115	70	115	Immed.	80	6	Normal adult
12	M	67	—	—	68	54 †	72	1 min.	72	9	Normal adult
13	M	62	+	+	80	75	80	Immed.	80	15	Arteriosclerotic heart disease
14	M	52	+	+	125	100 †	125	Immed.	110	3	Arteriosclerotic heart disease
15	M	54	+	+	125	110 †	125	Immed.	110	8	Arteriosclerotic heart disease
16	M	54	+	+	115	98	115	Immed.	110	7	Arteriosclerotic heart disease
17	M	45	+	+	106	85 †	106	Immed.	85	6	Arteriosclerotic heart disease
18	M	61	+	—	115	75 †	115	Immed.	76	1	Arteriosclerotic heart disease; diabetes mellitus
19	M	70	+	—	100	88 †	100	Immed.	88	2	Arteriosclerotic heart disease; diabetes mellitus
20	F	50	+	—	145	100	145	Immed.	105	18	Arteriosclerotic heart disease; diabetes mellitus
21	F	51	+	—	120	100	120	Immed.	100	1	Essential hypertension
22	M	64	+	—	90	68	90	Immed.	78	10	Normal adult
23	F	27	+	—	150	78	150	Immed.	78	7	Rheumatic heart disease, sinus rhythm, mitral stenosis and insufficiency

* The time given for the highest heart rate in the anoxemia test is the time of such rate's first appearance.

† In case 9 the anoxemia test was stopped at 12 minutes, in case 12 at 18 minutes, in case 14 at five minutes, in case 15 at three minutes, in case 17 at 11 minutes, in case 18 at eight minutes and in case 19 at 18 minutes. In all other cases the full 20 minute period of anoxemia was completed.

In the anoxemia test the T wave was altered as follows at the 20 minute or other greatest period of anoxemia (in those cases in which the test was discontinued before the full 20 minute period of anoxemia was reached the height of the T wave at the minute at which the test was stopped was used):

Lead 1: In 60.9 per cent of the cases the T wave became smaller; in 8.7 per cent of the cases it became taller, and in 30.4 per cent it remained unchanged.

Lead 2: In 47.8 per cent of the cases the T wave became smaller; in none of the cases did it become taller, and in 52.2 per cent it remained unchanged.

Lead 3: In 39.1 per cent of the cases the T wave became smaller; in 17.4 per cent of the cases it became taller, and in 43.5 per cent it remained unchanged.

Lead 4: In 47.8 per cent of the cases the T wave became smaller; in 8.7 per cent of the cases it became taller, and in 43.5 per cent of the cases it remained unchanged.

In one case there was complete reversal in the direction of the T wave in lead 4 F, i. e., an inversion, and this occurred at the 19 minute period of anoxemia; the T wave measured –0.5 mm. After one minute of 100 per cent oxygen the T wave became upright to a height of 1 mm. and remained upright. This was the only one of the positive anoxemia cases that was based on the criterion of T wave inversion in lead 4 alone.

No untoward reactions were encountered in any of our patients during the two step exercise test, and each of the 23 two step tests were completed. During the anoxemia test, however, a shocklike state appeared in one of the patients who was positive by both tests (case 17) after 11 minutes of 10 per cent oxygen, and the test was stopped. One hundred per cent oxygen with cardiorespiratory stimulants was administered successfully. In another patient (case 9), negative by both tests, the anoxemia test was stopped after 12 minutes, because the patient showed generalized cyanosis that became progressively worse. One hundred per cent oxygen was again administered successfully. In addition, the anoxemia test was also stopped before completion in one patient who was negative by both tests, in two patients who were positive by both tests and in two patients who showed positive two step tests but negative 10 per cent anoxemia tests. A review of these five cases showed that in one (case 12) the anoxemia test was stopped after 18 minutes of 10 per cent oxygen, because the patient exhibited severe dyspnea; in another (case 14) the test was stopped after five minutes, because the patient complained of severe precordial pain; in another (case 15) the test was stopped after three minutes, because the patient complained of severe substernal and precordial pain; in another (case 18) the test was stopped after eight minutes, because the patient complained of marked precordial oppression; in the other (case 19) the test was stopped after 18 minutes, because the patient complained of severe precordial pain.

TABLE 3.—*Time of First Appearance of Maximum RS-T Depressions in Two Step Exercise Test and Anoxemia Test**

Case	Result Tests		Lead 1				Lead 2				Lead 3				Lead 4			
			2 Step		Anoxemia		2 Step		Anoxemia		2 Step		Anoxemia		2 Step		Anoxemia	
	2 Step	10%	RS-T, Mm.	Time, Min.	RS-T, Mm.	Time, Min.	RS-T, Mm.	Time, Min.	RS-T, Mm.	Time, Min.	RS-T, Mm.	Time, Min.	RS-T, Mm.	Time, Min.	RS-T, Mm.	Time, Min.	RS-T, Mm.	Time, Min.
1	—	—	—0.25	Imm.	0	..	0	..	0	..	0	..	0	..	0	..	0	..
2	—	—	—0.25	Imm.	0	..	—0.25	Imm.	0	..	0	..	0	..	—0.25	Imm.	—0.25	1
3	—	—	0	..	0	..	0	..	—0.50	18	0	..	—0.50	8	0	..	0	..
4	—	—	0	..	0	..	0	..	0	..	0	..	0	..	0	..	0	..
5	—	—	0	..	0	..	0	..	0	..	0	..	0	..	0	..	0	..
6	—	—	0	..	0	..	0	..	0	..	0	..	0	..	0	..	0	..
7	—	—	0	..	0	..	0	..	0	..	0	..	0	..	0	..	0	..
8	—	—	0	..	0	..	0	..	0	..	—0.25	Imm.	0	..	—0.25	Imm.	0	..
9 †	—	—	—0.25	Imm.	0	..	—0.25	Imm.	—0.75	12	0	..	—0.25	1	—0.25	1	—1.75	12
10	—	—	0	..	0	..	0	..	0	..	—0.25	5	—0.25	9	0	..	0	..
11	—	—	0	..	0	..	0	..	0	..	0	..	0	..	0	..	0	..
12 †	—	—	0	..	0	..	0	..	0	..	0	..	0	..	0	..	0	..
13	+	+	—1.25	Imm.	—2	20	—1.25	Imm.	—3.25	20	0	..	0	..	—5	Imm.	—4.75	20
14 †	+	+	—0.25	1	—0.50	2	—1.25	Imm.	—2	4	—1	Imm.	—1	2	—0.50	1	0	..
15 †	+	+	—1.5	Imm.	—1	2	—1	Imm.	—1	2	0	..	0	..	—2.5	Imm.	—3	3
16	+	+	0	..	0	..	—0.50	Imm.	—0.25	11	—0.50	4	—0.50	15	—0.50	Imm.	0	..
17 †	+	+	0	..	0	..	—0.50	Imm.	—0.50	10	0	..	0	..	—3	Imm.	—2.5	9
18 †	+	—	—0.75	Imm.	0	..	—0.75	Imm.	—0.50	6	—0.25	Imm.	0	..	—1.5	Imm.	0	..
19 †	+	—	0	..	0	..	—1	Imm.	0	..	—0.50	Imm.	0	..	—1	Imm.	0	..
20	+	—	—0.25	Imm.	0	..	—0.25	Imm.	0	..	0	..	0	..	—1.75	2	0	..
21	+	—	0	..	0	..	—1	Imm.	—1	4	—0.50	Imm.	—0.25	1	—0.50	Imm.	—0.75	20
22	+	—	0	..	0	..	—0.50	Imm.	0	..	0	..	0	..	—0.50	4	0	..
23	+	—	—1	Imm.	—0.50	2	0	..	0	..	0	..	0	..	—1	Imm.	0	..

* "0" signifies no change during the test; "Imm." signifies an immediate appearance of the maximum RS-T depression following the two step test.
† In case 9 the anoxemia test was stopped at 12 minutes, in case 12 at 18 minutes, in case 14 at five minutes, in case 15 at three minutes, in case 17 at 11 minutes, in case 18 at eight minutes and in case 19 at 18 minutes. In all other cases the full 20 minute period of anoxemia was completed. (These data also apply to table 4.)

TABLE 4.—*Comparison of Control Height of T Wave in Each Lead of Two Step Exercise and Anoxemia Tests**

Case	Tests		Lead 1				Lead 2				Lead 3				Lead 4			
			2 Step		Anoxemia		2 Step		Anoxemia		2 Step		Anoxemia		2 Step		Anoxemia	
	Two Step	10% Oxygen	Cont.	Max.	Cont.	Max.	Cont.	Max.	Cont.	Max.	Cont.	Max.	Cont.	Max.	Cont.	Max.	Cont.	Max.
1	—	—	2.5	2.5	1.5	1.5	1.5	2.5	1	1	—1.5	—0.5	—1.5	—1.5	6	7	7	7
2	—	—	3.25	3	2.5	2	2.5	2	1.5	1.5	—2	—2	1	—1.75	3.25	3.5	5	3.5
3	—	—	2.5	1	2	1	3	2	3.5	0.5	0.5	1	0.5	—0.5	8	6	6.5	3.5
4	—	—	1.5	1	1.25	1.25	1.5	0.75	1	1	0	0	0	0	4	6	4	4
5	—	—	1	1	1.5	1	3	3	3	3	1.5	2.25	1.5	1.5	5	5	7	7
6	—	—	1.5	2	1.5	1.5	2	2.25	2.5	2.5	0.25	0.25	1.5	1	6	5	3	3
7	—	—	2.25	1.5	2.5	1.75	3	3.5	4	3	1.5	1.5	1.5	1	8.5	6	10	7
8	—	—	4	2.75	3.5	3	4	2.5	3	2	0	0.75	—0.5	—1	3	3	4	5
9	—	—	2	2	1.5	0.5	2.5	2.5	3	1	0.5	1	1.5	0.75	5	3.5	7	4.5
10	—	—	2.5	2	2.25	2.5	1	1	1.25	1	—1.5	—1	—1	—1.25	3	5	4	4
11	—	—	1.5	1.5	1.5	1	2	2	2.5	2	0.5	0.5	0.5	0.5	2.5	3.5	3	3
12	—	—	3	2	2	2	3	4	3	3	1	3	1	1	5	6	4.5	4.5
13	+	+	3	—2	2.25	—3	1.5	—2	1.25	—2.5	—1.5	1	—1.5	1	10	—6	11	—7
14	+	+	1.5	1	1.5	1	1	1	1	0.5	—1.5	0	—1	—2	7	7	9	11
15	+	+	1.5	0	2.5	0	1.25	1	1.5	0	—0.5	0.5	—1	1.5	6	3.5	8.5	0.5
16	+	+	1	1	0.75	0.5	1.5	2	2.5	2.5	1	2	2	2	1.5	2	0.25	—0.75
17	+	+	2	2	2	2	2.5	2.5	3	3	1.25	1.25	1.75	1.75	5	4	5	5
18	+	—	0.25	1	0.25	0.5	2	1	2	2	1.75	0.25	1.5	1.5	4	4	3.5	3.5
19	+	—	1.5	2.25	2	1	3	2.5	2.5	1.5	1.75	1.5	1	1	4.5	2.5	4	2.5
20	+	—	3	2	3	3	2	2	3	2	—1	—1	—0.5	—1	5	5	7	4
21	+	—	1.5	1.5	2.5	2	3.5	3	3	3	1.5	2	1	1.5	5	6	3.25	3
22	+	—	1	1	1.5	0.5	2	1.5	2	2	0.5	1	0.5	1	4.5	4	8	6.5
23	+	—	3	2	3	3	4	3	3	3	1.5	1	1	1	4	7	4	4

* The T wave height was recorded immediately after exercise and at the period of greatest anoxemia. The T wave height is given in millimeters; a diphasic T wave is recorded as "0."

In these five cases rapid administration of 100 per cent oxygen (which as previously explained is incorporated in the circuit) relieved the symptoms rapidly. In a short review of the anoxemia test as an aid in the diagnosis of coronary insufficiency Levy [4] mentions the precautions that must be taken before an anoxemia test is to be performed:

1. The control record should leave no doubt with regard to any recent myocardial infarction.
2. The test should not be repeated within 24 hours.
3. The test should not be done in the presence of congestive heart failure.
4. The test should not be done if cardiac infarction is known to have occurred within the preceding four months.

In none of the cases in this series were any of the above stated conditions present before the anoxemia test was performed.

COMMENT

Heart Rate.—The heart rate in the two step exercise test reached its maximum immediately on cessation of effort in all but two cases. In these cases the maximum was attained one minute after exercise. In some cases the heart rate rose slightly after a definite fall. Although the heart rate generally increased during the anoxemia test, the increase was not nearly so great as the increase that occurred after the exercise test. In some cases the cardiac rate fluctuated considerably during the entire period of anoxemia. The patient's nervous reaction to the test, with the associated reflex and sympathetic phenomena, must have played an important part in these fluctuations. Furthermore, variation in oxygen saturation or unsaturation of the blood during anoxemia [5] contributes to fluctuation in heart rate.

It is believed that the increase in heart rate after exercise is due in large part to decrease in vagal tone and to some extent to increased activity of the sympathetic nervous system.[6] Increased venous return through the Bainbridge reflex also tends to increase the heart rate after exercise starts.[7] In experimental work with dogs, Gasser and Meek [7] found that after destruction of the nervous system connections to the heart marked acceleration occurred after exercise. This observation tends to confirm the opinion that such factors as the direct action of epinephrine on the heart contribute to increase in heart rate after exercise.

During the anoxemia test the lowering of the oxygen tension in the inspired air causes decrease of arterial oxygen tension, with consequent lowering of oxygen saturation.[5] This effect is partly compensated by the increase in heart rate that results from decrease in vagal tone, increase in sympathetic nervous system activity and perhaps from direct action on the sino-auricular node.[8]

RS-T Segment and T Wave.—Exercise or anoxemia in a patient with diminished cardiac reserve due to coronary arterial disease intensifies existing abnormalities in the cardiac muscle. Changes may also be created in the physicochemical state of the myocardium when the work of the heart is increased, while its oxygen supply is decreased by inadequacy of the coronary blood flow. This condition exists in coronary insufficiency, which according to Master [9] "is a deficiency of the coronary circulation due to a discrepancy in the demands of the myocardium and its available oxygen or blood supply." Areas of ischemia with "injury" or "injury" alone may be created for a variable period with resultant alterations in the RS-T segments and the T wave of the electrocardiogram. These changes may not be related to pathological changes; they may be completely transient and "unattended by demonstrable structural changes." [10] The electrophysiological responses in and about the areas of ischemia and "injury" may have been changed by alteration of the normal depolarization and repolarization mechanism of the cardiac muscle.[11] Wolferth showed that trauma to the endocardium produced negative RS-T segment potential changes at the ventricular epicardial surface.[12]

The RS-T segment depressions and T wave changes that are the significant electrocardiographic alterations produced by the two step and anoxemia tests are generally seen in patients with involvement of the subendocardial layers of the myocardium. Schütz showed that moderate suction on the myocardium of the left ventricle, with the exploring electrode over the left ventricle on the chest wall, produced anoxemia of the subendocardium that resulted in RS-T segment depression in the electrocardiogram.[13] It is believed that the increased work of the myocardium following exercise and anoxemia causes the greatest and earliest strain on the subendocardium for the following reasons (Master,[14] Schütz,[13] Scherf,[15] Lepeschkin,[16] Puddu,[1b] Cabrera [17]):

1. The subendocardial layers are supplied by the terminal branches of the arteries.
2. These layers experience the greatest compression exerted on the myocardium during systole.
3. The duration of systole is longer in the internal than in the external layers of the heart. In effect, the papillary muscles that form part of the internal layers must relax last so that the valves hold until the end of systole.

In the electrocardiograms of normal persons taken after exercise the auricular T wave (T_a) becomes more

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pronounced and may cause depression of the RS-T segment below the isoelectric line. This change is largely due to the tachycardia, but increased sympathetic tone may also play a part. It has, however, little importance in our results and those of others [5b] since the T_a wave has been shown to be very small at the rates produced by each test. Hyperventilation in the anoxemia test may be a factor in RS-T segment and T wave changes in the normal patient, since it is known that decrease in carbon dioxide content of the blood and the resultant alkalosis produce RS-T segment changes and T wave inversions.[18] The small amount of exercise demanded by the two step test has not in our experience caused sufficient hyperventilation to produce false positives. Likewise, acidosis may alter RS-T segments and T waves.[19] However, the slight shift toward blood acidity produced by formation of metabolites such as pyruvic acid and lactic acid, following exercise or anoxemia as carried out in the Master exercise and Levy anoxemia tests, has not been shown to be a cause of pathological alterations in the RS-T segment and T waves.

In our investigation the positive anoxemia tests have infrequently shown only T_4 inversions. Among the present series of 23 patients T_4 inversion was the sole alteration in only one of the positive anoxemia tests. This patient had, however, a positive exercise test, and a diagnosis of arteriosclerotic heart disease was made.

In an attempt to explain the normal results that anoxemia tests sometimes give in patients with known myocardial involvement, Malmström [5b] points out that these persons have a great capacity for increasing alveolar ventilation and thus keep their alveolar and arterial oxygen tension on a relatively high level during the test. This may explain the negative anoxemia tests that were obtained in five of our patients who had known myocardial disease and in one who later proved to have organic heart disease, all of whom responded positively to the two step exercise test.

It has been suggested by some authors that our criteria for a positive exercise tolerance test are too liberal. In recent review of the Master two step test Grossman, Weinstein and Katz [1g] concluded that 0.75 mm. RS-T depression or more in a limb lead and 1.5 mm. or more in a chest lead were more accurate criteria for a positive exercise test. Many other authors [20] have suggested that similar or greater increases in the depth of the RS-T deviations should be adopted as criteria for a positive test. They believe that with more liberal standards false positive tests will be rare. We are of the opinion that the more liberal the criteria the less sensitive will be the test and the less its value. In this connection it should be stressed that we employ as the zero line the central isoelectric level (P-R level) and not the control height of the RS-T segment. When the single two step test is negative the patient is given the double two step test, in which the number of trips and the time interval are doubled, so that the rate of effort remains the same. In a small proportion of cases in which cardiac disease was believed to be present in spite of a negative single two step test the double two step was of value in establishing the diagnosis.

SUMMARY

1. Twenty-three patients with normal resting electrocardiograms but with histories of precordial pain were given the two step exercise tolerance test and the 10 per cent anoxemia test. In the exercise test electrocardiograms were taken each minute for 10 minutes after exercise; in the 10 per cent anoxemia test electrocardiograms were taken each minute for 20 minutes during the administration of 10 per cent oxygen.

2. The most rapid heart rate in the two step exercise test was present in the electrocardiogram taken immediately after the exertion. In the 10 per cent anoxemia test there was no correlation between the period of anoxemia and the heart rate. The heart rate generally increased with the period of anoxemia but not so much as it did in the two step exercise test. Furthermore, in some patients the heart rate fluctuated considerably during the entire period of anoxemia.

3. RS-T segment depressions of over 0.5 mm. in the electrocardiograms taken immediately after the end of exercise were most frequent in lead 2, then lead 1, lead 4 and lead 3. Lead 4 showed the deepest depressions, then leads 2, 1 and 3 in that order. In the 10 per cent anoxemia test no correlation was present between the degree of RS-T segment depression and period of anoxemia; nor could any correlation be made of RS-T segment depression with the period of anoxemia and the time interval following the two step exercise test. This may be due to the varying oxygen saturation of the blood during the anoxemia test.

4. In both the 10 per cent anoxemia and the two step exercise tests the T wave is generally reduced in height; however, in a small percentage the amplitude of the T wave is increased. These changes could not be predicted in either test.

5. In this series the two step test was more sensitive and of greater diagnostic aid than was the anoxemia test. Positive two step tests appeared in the six patients who were known to have organic heart disease. The anoxemia test was negative in these six cases. Although a positive anoxemia test was considered reliable, a negative anoxemia test was not found to be dependable.

6. No untoward reactions occurred in any of the patients during the two step exercise test. During the anoxemia test a shocklike state developed in one of the patients, severe cyanosis in another and severe precordial or substernal pain in five others.

7. Examination of the material presented in this paper makes it apparent that there are many differences in the electrocardiographic responses produced by the two tests. They cannot be used interchangeably.

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POTASSIUM DEFICIENCY IN BULBAR POLIOMYELITIS

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During the past several years there have been an increasing number of reports concerning potassium deficiency in many clinical conditions, including infantile diarrhea,[1] alkalosis due to intestinal and pyloric obstruction and vomiting,[2] and in many postoperative patients.[3] Our studies on potassium metabolism in surgical patients have led us to investigate many other conditions we believed might be associated with a deficiency of potassium. Three cases of bulbar poliomyelitis in which the electrolyte metabolism was studied are reported.

REPORT OF CASES

CASE 1.—A woman aged 29 was admitted to Cook County Contagious Hospital on Sept. 13, 1950, with a history of dysphagia of two days' duration. This dysphagia was manifested by inability to swallow, accumulation of saliva, and a "full feeling in the throat." Temperature was 102.4 F., pulse 100, and respirations 20. A nasal twang, slight redness of the pharynx, paralysis of the soft palate, and a moderate amount of accumulated secretion in the mouth were present. Nuchal rigidity was slight. Neuromuscular examination revealed a head drop but no apparent weakness of the extremities. Reflexes were normal. A diagnosis of bulbar poliomyelitis was made. Treatment consisted of placing the patient in the Trendelenberg position and intravenous administration of the usual fluids. On the following day the temperature had risen to 103.6 F.; and the bulbar symptoms were prominent, but there was no evidence of lower motor paralysis or respiratory difficulty. This course continued until Sept. 15, when cyanosis was noted and a tracheotomy was performed. On Sept. 16 the patient was afebrile; her color was good and her respiration strong, but she was still unable to swallow. Intravenous fluids were administered daily. On Sept. 19 the patient responded poorly and became cyanotic, and her respiration was shallow and irregular. A portable respirator was applied immediately, and oxygen was administered. The patient responded and her color returned, but she was markedly lethargic. Laboratory studies on this day disclosed the following: serum potassium 3.5 mEq. per liter (in our laboratory normal is considered 4.2 to 5.8 mEq. per liter), sodium 135 mEq. per liter, chloride 89 mEq. per liter and CO_2 combining power 77 volumes per 100 cc. Treatment with intravenous potassium chloride was instituted. Twelve grams of potassium chloride was administered on Sept. 19 and 20. Blood chemistry studies were performed daily, and on Sept. 21 the serum potassium was 5.0 mEq. per liter, sodium 138 mEq. per liter, chloride 98 mEq. per liter and CO_2 combining power 58 volumes per 100 cc. Clinically the patient was markedly improved. She asked to be removed from the respirator. Her respirations were regular and her color excellent, and less secretions were noted in the throat and pharynx. The patient continued to receive 4 gm. of potassium chloride intravenously daily until tube feedings were instituted. By Sept. 23 the patient was considered out of danger, and two days later the tracheotomy tube was removed. Tube feedings were begun and tolerated on the following day.

CASE 2.—A young woman aged 18 was admitted to the Cook County Contagious Hospital on Sept. 8, 1950, with fever, headache and difficulty in swallowing of two days' duration. A spinal tap was performed at another hospital and showed a pleocytosis consisting of 374 cells per cubic millimeter, predominantly lymphocytes. Physical examination revealed a very apprehensive white woman who was in no acute distress. Temperature was 104 F. (rectal); pulse, 88; and respirations, 22. There was a palatal deviation to the left and a left facial weakness. The neck was rigid. There was only a slight weakness of the left thigh muscles, but the reflexes were normal. A diagnosis of poliomyelitis was made, and therapy consisting of Trendelenberg position and parenteral fluids was instituted. This clinical course continued with some progression of symptoms to Sept. 14, when the patient was afebrile. At this time she had a marked left facial, hypoglossal, iliopsoas, and quadriceps paralysis and right gluteus medius weakness. Treatment consisted of physical therapy, hot packs, and intravenous fluids. On Sept. 19 the serum potassium was 3.9 mEq. per liter, and the sodium, chloride, and the CO_2 combining power were normal. Treatment with intravenous potassium chloride was instituted. On that day and the following day she received a total of 14 gm. of potassium chloride. On Sept. 21 the serum potassium was 4.7 mEq. per liter and the patient was much improved. She was clearer mentally, stronger, and more cheerful, but still unable to take oral fluids. Two grams of potassium chloride was administered daily until Sept. 25, when gavage feedings were instituted.

CASE 3.—A boy aged 9 yr. was admitted to the Cook County Contagious Hospital on Sept. 19, 1950, with a history of fever, lethargy, and weakness of the left leg. Two days before admission the patient began vomiting, and his mother noted a nasal twang to his voice. Physical examination revealed an extremely lethargic white boy, whose temperature was 101 F. (rectal); pulse, 100; respirations, 30. The patient had a head drop, a marked nuchal rigidity, and positive Kernig's and Brudzinski's signs. There was some pharyngeal weakness, but other reflexes were normal. Spinal tap revealed 56 cells per cubic millimeter, 60% of which were lymphocytes. Treatment consisted of parenteral fluids and Trendelenberg position. On Sept. 21 the serum potassium was 3.9 mEq. per liter, and potassium therapy was instituted. On Sept. 21 and Sept. 22 he received a total of 8 gm. of potassium chloride. The serum potassium on Sept. 23 was 4.6 mEq. per liter, the patient was afebrile, his sensorium was clear, and he was able to take oral nourishment.

These patients were unable to swallow due to the pharyngeal paralysis. Two of the patients had received the usual parenteral fluids without potassium for at least 10 days. The patients showed marked loss of strength and energy and were listless and lethargic. They were treated with intravenous potassium chloride. Twenty-four hours later the clinical condition of all three patients had markedly improved; lethargy and listlessness were absent and their energy had increased a great deal. This clinical response was dramatic. The marked improvement was obvious to all members of the medical and nursing staffs, and the patients themselves commented on their increased strength and sense of alertness.

The three cases of bulbar poliomyelitis reported are from the services of Drs. Leichenger, Hoyne, and Rosi.

From the Hektoen Institute for Medical Research of the Cook County Hospital. Solomon Foundation Fellow, Karl A. Meyer Fellowship, (Dr. Lans); Solomon Foundation Fellow (Dr. Stein), and Hektoen Institute Fellow (Dr. Becker).

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COMMENT

Paralysis of the pharyngeal musculature is very frequent and troublesome in patients with bulbar or encephalobulbar poliomyelitis. This results in difficulty or inability to swallow, associated with regurgitation. The inability to swallow necessitates the use of intravenous and subcutaneous fluids to provide nutrition and prevent dehydration. Dehydration in patients involves not only the problem of water depletion but an imbalance of electrolytes. Since patients with bulbar poliomyelitis often require prolonged parenteral alimentation, the electrolyte and fluid balance of these patients becomes important.

The usual parenteral solutions contain little or no potassium; therefore, patients sustained on these fluids alone receive inadequate potassium. In addition, solutions containing sodium chloride without potassium, increase the renal excretion and further deplete the body store of potassium.[4] As a consequence of the reduced intake of food, the oral intake of potassium is decreased. Thus, the continued loss through vomiting,[5] and daily urinary excretion,[6] without adequate intake, leads to potassium deficiency. In dehydrated patients the serum potassium level may be normal even though a severe cellular deficiency is present; after these patients are hydrated, a low serum potassium is often found. Certain signs and symptoms are known to be associated with a potassium deficiency,[7] including loss of strength and energy, listlessness, and anorexia. Weakness of the extremities develops and progresses to flaccid paralysis. Sometimes an ascending or Landry's type of paralysis may be present. Cranial nerves are rarely involved. Weakness of respiratory muscles is often marked; paralysis of the intercostal muscles and diaphragm may be present. Breathing becomes rapid and shallow, and use of accessory muscles and gasping respiration become evident. In the absence of prompt potassium therapy, respiratory paralysis and death may ensue.

Patients with bulbar poliomyelitis have a limited respiratory reserve and must be watched closely and carefully for evidence of respiratory failure. Any condition which further decreases the patient's ability to breathe will increase the mortality. Weakness and paralysis of respiratory muscles are often present in potassium deficiency. Patients with bulbar poliomyelitis cannot tolerate the superimposed symptoms of a potassium deficiency. Therefore, adequate intake of potassium must be provided these patients to prevent the occurrence of these additional symptoms.

Excellent reviews of potassium deficiency and its treatment have been presented by Bodansky,[7a] Randall,[2b] Danowski,[7b] Darrow,[7c] and Elkinton and Tarail.[6a] Solutions containing varying concentrations of potassium salts have been advocated by these authors and we are investigating the use of these solutions. In patients with renal insufficiency or dehydration, administration of potassium salts must be cautiously given and only under constant and proper clinical and laboratory supervision. Rapid intravenous injection of concentrated solutions may lead to a high serum level which is toxic to the heart and cause heart block and cardiac arrest. It is necessary to regulate the rate of introduction to avoid a toxic level of potassium in the serum. Therefore, at present, a solution containing 2 to 3 gm. of potassium chloride in a liter of normal saline, 5% or 10% dextrose or amino acids, is recommended for general use. This solution should be administered not faster than 8 to 12 cc. (120-180 drops) per minute.

The patient with bulbar poliomyelitis should receive daily adequate amounts of intravenous fluids containing dextrose, sodium chloride, and amino acids in order to maintain hydration, electrolyte balance, and nutrition. When potassium deficiency is found to be present, 2 to 3 gm. of potassium chloride should be added to each liter of intravenous fluid so that the patient receives 6 to 12 gm. of potassium chloride a day.

This treatment is continued until the serum potassium level has been normal for 24 hr., after which 4 gm. of potassium chloride should be administered daily to provide a minimal daily intake of potassium. Most foods are a good source of potassium; therefore, parenteral potassium therapy is no longer needed after the patient can be fed.

SUMMARY AND CONCLUSIONS

Three patients with bulbar poliomyelitis were found to have a potassium deficiency. Treatment of the existing deficiency with intravenously administered potassium chloride resulted in a marked improvement of their condition.

Patients suffering from bulbar poliomyelitis who are unable to eat will develop a potassium deficiency unless adequate potassium intake is provided. Severe, prolonged potassium deficiency can be lethal. This condition when present in patients with bulbar poliomyelitis may be a contributing factor in the high mortality rate. Proper treatment of electrolyte imbalance in these patients is essential and must include adequate potassium therapy. Further studies are indicated concerning the relationship of potassium deficiency to the clinical picture and mortality of poliomyelitis.

ADDENDUM

Since preparation of this report, three additional patients with bulbar poliomyelitis were found to have a marked hypopotassemia. Institution of intravenous potassium chloride therapy resulted in a prompt and definite clinical improvement in all three patients.

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TREATMENT OF UREMIA BY PERFUSION OF AN ISOLATED INTESTINAL LOOP

SURVIVAL FOR FORTY-SIX DAYS AFTER REMOVAL OF THE ONLY FUNCTIONING KIDNEY

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and
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In 1946, de Leeuw and Kolff[1] treated a patient with contracted kidneys and uremia by dialysis through an intestinal loop. A loop of small intestine was separated by transverse sections and the ends brought out through lateral stab wounds, leaving the vasculature intact. The continuity of the remaining intestine was restored by end-to-end anastomosis. The isolated intestinal loop was perfused. Rinsing fluid from a reservoir was let into the proximal end of the intestinal loop after passage through a Murphy drip and through a thermostatically controlled bath to bring it up to body temperature. From this first patient 5 gm. of urea could be removed in 10 hours of perfusion.

Since then, all our patients with severe chronic uremia were treated with a forced high-caloric, low-protein diet according to the principle of Borst. Conditions demanding intestinal dialysis rarely occurred.

Odel and Ferris,[2] Seligman, Frank and Fine,[3] and Ask-Upmark[4] in Sweden have also attempted to treat patients by intestinal dialysis. While the outcome in these patients and in ours was for various reasons unsatisfactory, enough evidence has accumulated to establish the fact that intestinal dialysis can remove sufficient urea to maintain urea balance. White and Harkins[5] concluded that irrigation of intestinal loops would remove fairly large amounts of urea, but it did not prolong the life of the nephrectomized animals because of severe disturbance in the electrolyte pattern of the blood. It is therefore most important to find a rinsing fluid that will not disturb but will even correct the patient's water and electrolyte balance.

Visscher[6] and his group confirmed the conclusion of Heidenhain that forces other than those of normal osmosis determine the rate of water transport, and they prove that sodium chloride can move into the blood against a large concentration gradient, but solutions from which there was a significant water absorption were definitely hypotonic.

We[7] have performed more than 200 intestinal perfusions on dogs in order to find a suitable rinsing fluid. A concentration of 100 to 200 mg. per 100 ml. of sodium chloride in the lavage fluid usually prevented chloride absorption or excretion by the intestinal mucosa when the flow rate was 1 to 1.5 L. an hour. To prevent water absorption, the lavage fluid had to contain substances which are absorbed slowly or not at all by the intestinal mucosa (such as sucrose or magnesium sulfate). The composition of the lavage fluid had to be such that it was isotonic with or slightly hypertonic to plasma. Like Claus Brun in Copenhagen,[8] we compared the freezing point depression of plasma and lavage fluid, taking care that the freezing point of the lavage fluid was never below that of the blood plasma. Potassium and calcium salts were added to prevent calcium and potassium loss during lavage.

REPORT OF CASE

On March 15, 1949, a right nephrectomy was performed on a 36 year old man for infected hydronephrosis. Anuria followed, and the patient was transferred to our hospital. On cystoscopic examination, it proved impossible to pass a catheter through the ostium of the left ureter. After 10 days of practically complete anuria, an exploratory laparotomy was done. The left kidney region was found to be empty. A small piece of tissue could be felt at the level of the third lumbar vertebra. Since it was concluded that there was no adequate remnant of kidney, a loop was prepared from 2.5 m. of the midsection of the small intestine, and the two orifices were sutured into the abdominal wall. The continuity of the remaining intestine was restored by end-to-end anastomosis. Data on this patient are shown in charts 1 and 2.

Diuresis.—The left aplastic kidney was able to produce some urine. The total amount of urine produced over 46 days was 6.4 L., or 140 ml., a day. The total urea excreted in the urine was 28 Gm., or 0.6 Gm. a day.

Blood Urea.—There was a steady rise of blood urea, which increased to 369 mg. per 100 ml. on the sixteenth day after the nephrectomy. This level was lowered a little by cautious daily perfusion through the intestinal loop from the 16th to the 18th day. The patient was treated with the Kolff rotating artificial kidney on the 19th and the 24th day after nephrectomy. Seventy-two and 53 gm. of urea, respectively, were removed by these procedures, and the blood urea was reduced to 167 mg. per 100 ml.

On the 29th day a new series of perfusions through the isolated intestinal loop were performed. As may be seen from chart 1,

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This study was done at the Department of Internal Medicine of the Municipal Hospital (Head, W. J. Kolff), Kampen, Netherlands.

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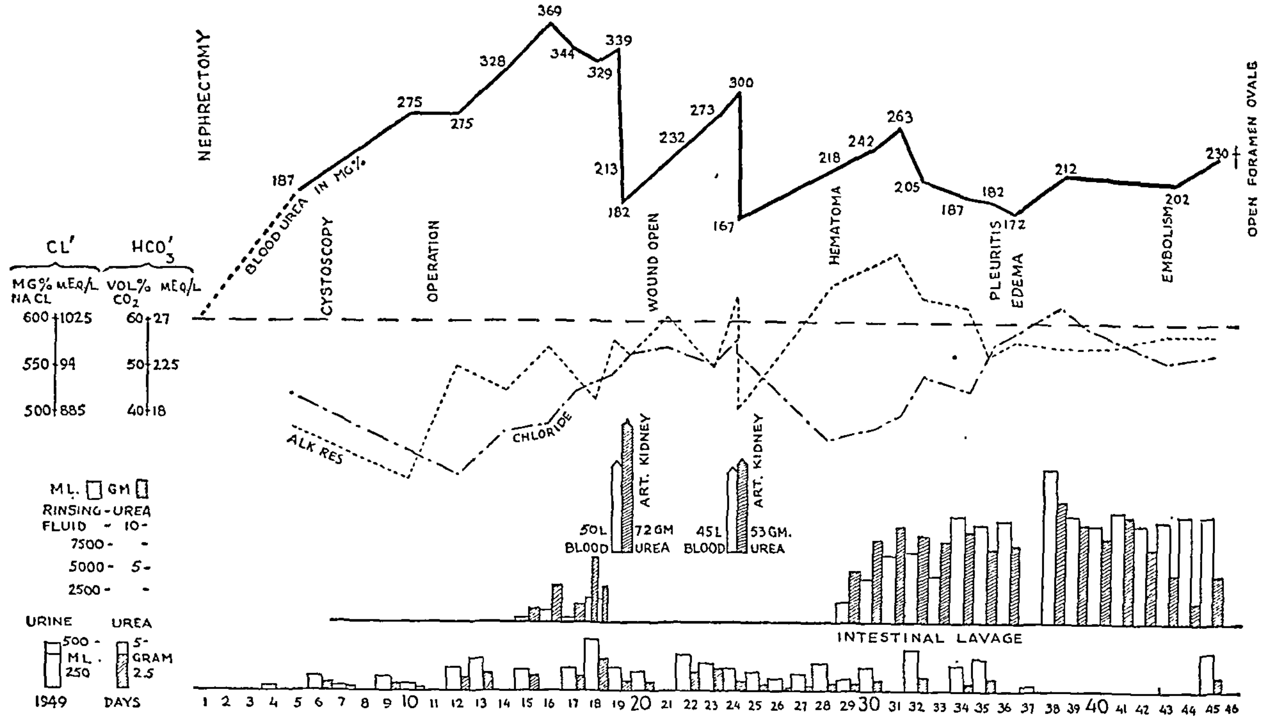

Chart 1.—A 36 year old man had his only functioning kidney removed on the day when the first point of this graph begins. His blood urea in mg. per 100 ml. is shown in the broken line. *Note that it was twice reduced by treatment with the artificial kidney and that it stayed about 200 mg. from the* 32d to the 45th day. On the lowest line the unshaded blocks indicate the total amount of urine produced each 24 hours by the patient's aplastic left kidney (an average of 140 ml. a day), and the shaded blocks indicate the total amount of urea excreted by this kidney (an average of 0.6 gm.). On the second line from the bottom the unshaded blocks indicate the amount of rinsing fluid that perfused the isolated intestinal loop and the shaded blocks indicate the amount of urea removed in one dialysis (an average of 8.6 gm. per 10 hours). - - - - - indicates the normal average value of blood urea, plasma chloride, and alkali reserve; -.-.-.-.-.-. indicates Cl-, and .... HCO_3-.

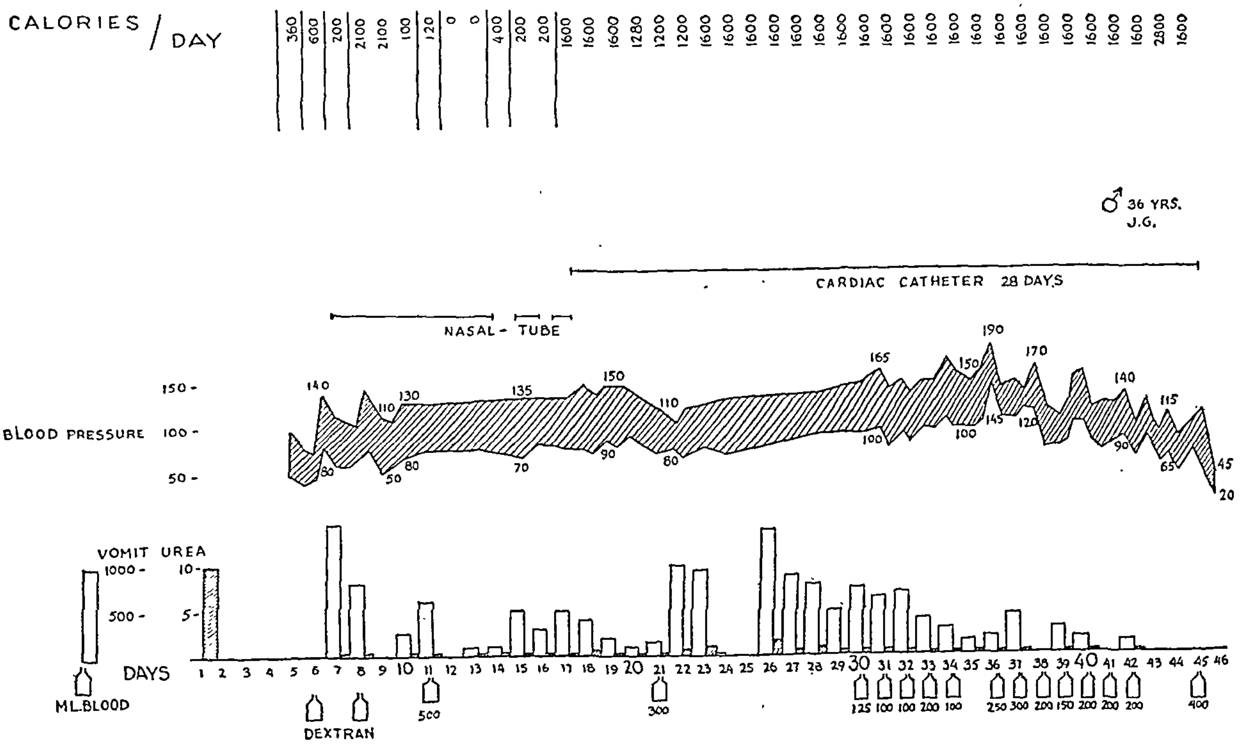

Chart 2.—This is a graph of the same patient as in chart 1. The same number of days after nephrectomy is shown at the bottom of the graph. The bottles indicate infusions with dextran, blood or amigen to counteract low blood pressure. Unshaded blocks indicate the amount of vomitus. Vomiting decreased after 36 days. The negligible amount of urea found with vomitus is indicated by shaded blocks. The blood pressure as indicated by the shaded area rose to 190/145 when the patient had edema, but decreased when water and sodium were withdrawn. Calories per 24 hours, given by mouth, tube or cardiac catheter, are shown at the top. The considerable amount of calories resorbed from the intestinal loop has not been taken into account.

the blood urea fell from 263 to 172 mg. per 100 ml. and was kept at a level of about 200 mg. until shortly before the death of the patient. He suffered from complete anuria during nine of these last 16 days.

Dietary Treatment.—It proved impossible to feed this continuously vomiting man with a butter-and-sugar diet according to Borst's principle. Feeding by gastric tube was attempted, but even this proved impractical. The amounts of vomitus are recorded in chart 2. The amounts of urea removed with the vomitus proved to be negligible. On the 17th day after the nephrectomy, a thin polyvinyl plastic cardiac catheter was inserted to feed the patient with 1 l. of 40% dextrose a day, to which were added heparin sodium (100 to 200 mg.), insulin, penicillin, vitamin C and vitamin B complex. In this way, with 1 L. of 40% dextrose, 1,600 calories could be provided every 24 hours without the risk of overloading the patient with fluid (deKeyser, Van Eekhoutte, Kop and Kolff).[9] Moreover, sodium chloride and sodium bicarbonate could be added as seemed necessary. The cardiac catheter was left in place for 28 days. No signs of local irritation were observed. The patient's general condition was fair except for vomiting, but the latter state improved gradually on the 36th day.

Composition of Rinsing Fluid for Intestinal Dialysis and Absorption or Excretion of Water and Chloride

Days After Nephrectomy	Composition of Rinsing Fluid, Mg./100 Ml. NaHCO₃	KCl	$CaCl_2$	NaCl	Sucrose	Dextrose	$MgSO_4 \cdot 7H_2O$	Osmotic Pressure Calculated in Milliosmols per L.	Fluid Absorbed or Excreted, Ml.*	Chloride Absorbed or Excreted, Gm.*	Urea Excreted, Gm.	Flow, Ml./Hr.
29	0	40	28	500	6,000	0	1,230	±500	150 E	3 A	5	600
30	200	40	28	360	6,000	0	1,230	464	1,400 A	9 A	9	500
31	200	40	28	360	6,000	0	1,230	464	800 A	13 A	10	750
32	0	40	28	360	6,000	0	1,230	416	2,300 A	16 A	9	950
33	0	0	28	...	0	6,000	1,230	564	3,700 A	6 A	9	950
34	0	0	28	360	6,000	3,600	2,460	526	1,400 E	10 A	10	1,200
35	0	0	0	360	6,000	3,600	0	498	700 E	9 A	8	1,300
36	200	0	0	360	6,000	3,600	0	546	1,050 E	6 A	8	1,300
38	0	0	28	0	6,000	3,600	2,000	545	3,400 E	9 E	13	1,300
39	66	0	28	0	6,000	3,600	1,000	480	1,800 E	6 E	11	1,400
40	66	0	28	0	6,000	3,600	1,000	480	1,260 E	7 E	9	1,300
41	66	0	28	0	6,000	3,600	1,000	480	890 E	8 E	12	1,400
42	66	0	28	70	6,000	3,600	1,000	503	800 E	4 E	8	1,400
43	100	10	28	50	6,000	3,600	2,000	589	1,300 E	7 E	5	2,100
44	100	10	28	50	6,000	3,600	2,000	589	2,000 E	4 E	2	1,600
45	100	10	28	50	6,000	3,600	2,000	589	1,900 E	4 E	5	1,500

* A indicates absorption; E, excretion.

Complications.—On the 20th day there was disruption of the laparotomy wound, and it had to be sutured. This event forced us to postpone intestinal perfusion until the 29th day. On the 28th day, a hematoma developed in the abdominal wall; it may have been due to the constant vomiting and the necessary heparinization. The heparin dosage was temporarily decreased. This may have permitted the formation of small thrombi along the catheter. These thrombi probably gave rise to small emboli, which accounted for some pulmonary symptoms. More serious, however, were small emboli which first appeared in the legs and hands, reminiscent of those in bacterial endocarditis. On the 42nd day the patient suddenly became unconscious and new emboli were observed in the hands and feet. When he awakened he was partly paralyzed and for some time aphasic. We still did not dare to remove the cardiac catheter, although feeding could be performed by way of the intestinal loop. There was no other method of supplying daily infusions of blood, dextran and a protein hydrolysate (aminosol or amigen®) needed to sustain the blood pressure, which showed a tendency to fall. Since embolism continued, the catheter was removed on the 45th day. The patient became comatose and died the day after. At autopsy there were slight generalized edema and arterial emboli in the hands. The left kidney was hypoplastic and hydronephrotic. Its length was 6 cm. The renal cortex was atrophic and 1.5 mm. broad. The left ureter was dilated above and constricted in its course through the bladder wall. A long thin cylindrical thrombus was present that contained a lumen large enough to pass the catheter and indicated where it had lain in the veins and in the right auricle. Apart from this thrombus, the endocardium presented a smooth and undamaged surface. An open foramen ovale explained how emboli from the catheter thrombus entered the greater circulation. (Afterward we heard that three years previously the patient had suffered from a sudden attack of unconsciousness, which then was also thought to be a cerebral vascular accident.) The right kidney was absent. There was an old hemorrhage in the left adrenal gland.

COMMENT

Urea.—Chart 1 shows that during the period of daily intestinal perfusion from the 30th to the 46th day, the blood urea was maintained at a level of about 200 mg. per 100 ml. Over a period of 16 days (with one day's rest), 134 gm. of urea was removed, or an average of 8.6 gm. a day during 8 to 10 hours of perfusion.

Creatinine and Uric Acid.—The amount of creatinine removed was about 6.8% of that of urea, and the amount of uric acid, 4.8%. As the concentrations of these substances in the blood plasma amounted to 7% of the concentration of blood urea, we may assume that they were eliminated probably almost as well as was the urea. The creatinine and uric acid in the blood did not show any increase during the 40 days of observation.

Water and Sodium Chloride.—Our observations with the dog, on which a comparatively short ileac loop was used, led us to select for this patient a perfusion fluid that proved unsatisfactory, probably because the loop was much longer. During the four days of perfusion (30th to 34th days inclusive), a total of 8 L. of water was absorbed during the dialysis (table). Further absorption of water was prevented by increasing the osmotic pressure of the rinsing fluid by the addition of sucrose, dextrose or magnesium sulfate. Water was now withdrawn, while sodium chloride was still absorbed (10, 9 and 6 gm. a day). The plasma chloride rose to a normal value, and, as vomiting stopped and the patient was allowed to drink, edema appeared. During this first period of eight days, a total of 72 gm. of sodium chloride had been absorbed. We then decided to remove both the edema and the excess of salt by perfusion. This was accomplished by maintaining the osmotic concentration of the rinsing fluid at its former level while at the same time decreasing its content of sodium chloride first to 0 and then to 50 mg. per 100 ml.; potassium chloride, calcium chloride and sodium bicarbonate were not changed. From the 34th to the 45th day, 16 L. of fluid were eliminated. This demonstrates that it was possible to obtain a "diuresis" of 1.5 L. a day through this intestinal loop. From the 38th to the 45th day, 48 gm. of sodium chloride was excreted by the intestinal loop, an average of 6 gm. per day.

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Arterial Pressure.—During the period of positive chloride balance, the blood pressure rose to hypertensive levels (chart 2). With withdrawal of sodium chloride through the loop, the pressure fell slowly to normal and then to hypotensive levels. This patient was virtually bilaterally nephrectomized, so that it is possible that his "sodium-responsive" hypertension was not of renal origin. The apparent sensitivity of the nephrectomized subject to the pressor effects of excess sodium may account for the hypertension observed in nephrectomized dogs submitted to blood dialysis against a sodium-rich medium.[10]

Potassium.—Since the patient had a high serum potassium (33 mg. per 100 ml.), no potassium was added to the rinsing fluid at first and from 0.8 to 2.4 gm. of potassium was removed a day. The serum potassium dropped to 17 mg.

Sodium Bicarbonate.—Sodium bicarbonate usually was absorbed from the rinsing fluid. It was possible to keep the carbon dioxide-combining power at a normal level by using sodium bicarbonate from 200 to 66 mg. per 100 ml.

Calcium.—Calcium was nearly always added to rinsing fluid (calcium chloride, 28 mg. per 100 ml.). This prevented both significant absorption and loss of calcium.

Sugar.—Dextrose is a substance that is rapidly absorbed, whereas sucrose is absorbed only after enzymatic hydrolysis. Consequently, sucrose or a mixture of sucrose and dextrose was added to the fluid. Nevertheless, 300 to 400 gm. of dextrose was often absorbed. Consequently one day's perfusion provided 1,200 to 1,600 calories plus a small volume of water of oxydation.

Local Effect.—We never saw any irritation of the skin even after prolonged contact with the dialyzing fluid. The local effect was limited to irritation of the mucosa of the loop when a strongly hypertonic fluid was used. Care should be taken to avoid decubitus of the stomata by inflow or outflow tubes. It is well to bear in mind that de Peyster and Straus[11] produced multiple mucosal ulcerations with continuous perfusion of an ileal loop in dogs, using 20% sucrose-Tyrode solution. We have not used such high concentrations and have avoided continuous dialysis over a period longer than 70 hours.

As a result of our experience in this case, we suggest the following general formula for the rinsing fluid in an isolated intestinal loop:

Glucose	0-3.6%
Sucrose	6-8%
Sodium chloride	0-150 mg./100 ml.
Potassium chloride	0-40 mg./100 ml.
Calcium chloride	0-28 mg./100 ml.
Sodium bicarbonate	100-200 mg./100 ml.

This formula can be modified according to the special features of the patient to be treated. Sucrose can be partially replaced by $MgSO_4.7H_2O$, 2 per cent. The use of carbomethylcellulose is being studied at present.

SUMMARY

A man 36 years old was hospitalized for 46 days after removal of his only functioning kidney. He was kept in urea balance by dialysis through an isolated intestinal loop for 16 consecutive days. In this patient the blood pressure varied in proportion to the sodium chloride and water balance. Salt and water balance could be maintained by appropriate adjustment of the composition of the rinsing fluid. The rinsing fluid should usually be hypertonic and should not contain more than 150 mg. sodium chloride per 100 ml. As a result of study of this patient, a more useful rinsing fluid has been developed.

Groenezoom 242, Rotterdam (Dr. Twiss).

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10. Grollman, A.; Muirhead, E. E., and Vanatta, J.: Role of Kidney in Pathogenesis of Hypertension as Determined by Study of Effects of Bilateral Nephrectomy and Other Experimental Procedures on Blood Pressure of Dog, Am J. Physiol. **157:** 21 (April) 1949.

11. de Peyster, F. A., and Straus, F. H.: Use of Hypertonic Solutions for Enteric Perfusion, J. Lab. & Clin. Med. **34:** 944 (July) 1949.

Discarded Theories and Treatments.—It is salutary to look back in Medicine. Its path is strewn with discarded theories and treatments which held the field for short and credulous periods; and when some are thrown up again by the whirligig of time, a knowledge of the part which they have played in the evolution of our ideas is always helpful. It is often chastening. When orthodox medicine fails, unorthodox methods appear; and that is easy enough to understand. What we often do not recognise is the frequency with which ill-founded theories become accepted by the orthodox, and how ideas of slender foundation may dominate for a time a whole branch of medicine. The fact that ideas or treatments have been discarded does not mean that they were ill founded or completely without results. They may have been followed by better ideas or treatments. Sometimes they are unjustly displaced, and in the process much that was good becomes forgotten.—C. Cameron, M.D., Fads and Fancies: Thirty Years of Tuberculosis, *Lancet*, April 14, 1951.

SPECIAL ARTICLE

CITIZENSHIP—A PHYSICIAN'S OBLIGATION

Ernest E. Irons, M.D., Chicago

American freedom or socialistic enslavement—which shall it be? A decade or so ago, most citizens would have been shocked that any sane person should dare to ask such a question. Liberty and opportunity were the substance of our social, political, and economic tradition. True, the increasing complexities of urban life with its rising standards of living and the impact of world troubles constantly imposed new problems to be solved and new social injustices to be corrected, but, despite these difficulties, we continued to enjoy our American freedom and assumed that our birthright could never be taken away.

The vast and increasing confusion in which the American people now are groping would have been inconceivable to the average intelligent citizen thirty years ago. We had made mistakes, but our former national common sense saved us from catastrophic accidents. Our departure from sound economics and honesty can be explained only by a growing disregard for moral values in business, in labor, in politics, and in our relations with our fellow men. Never before has public confidence in our administrative political leaders fallen to so low an ebb as now.

After years of at times deceitful planning, the promoters of the Socialist Welfare State decided that the public and some members of Congress were sufficiently misinformed and confused to ensure the enactment into law of the nationalization of medicine. This attempt to take a long step down the Socialist road to communism failed, but only because patriotic democratic members of Congress broke with a misguided federal administration and refused to accede to this socialistic regimentation of their countrymen. Socialization of medicine was again made an issue in the congressional elections of 1950, but by this time many of the misstatements of socialistic bureaucrats had been exposed by a vigorous campaign of education. As a result, sound thinking triumphed over personal political expediency.

SOCIALISTIC DEGENERATION IN MEDICINE AND GOVERNMENT

The education of the American people in matters medical is now well begun. Apparently the election of Nov. 7, 1950, made clear the opinion of the voters on the issue of socialized medicine. The more they learned about it and observed its working in England, the less they wanted it. Physicians themselves became more aware of what medicine in a free economy had accomplished and of how political medicine would impair the quality of medical service to their patients, the public. The assumption by government of the supervision of the health and private lives of citizens is an early and, in the past, successful Marxian technique in the socialization of the state.

Socialized medicine was only one of the issues in this campaign, but it was one which the voters when fully informed could understand. Health and liberty of choice are closer to men's hearts and lives than the more abstract but equally important issue of the impact of socialism on government. The roots of socialism in this country have spread far beyond medicine, deep into many phases of our national life.

Physicians had been expected to attend principally to their profession, and this they traditionally, and perhaps unfortunately, had done. In self-defense and in the interest of the welfare of the public they were now suddenly propelled into medicosocial problems with which they should have been more conversant, and then into the midst of political combat in which they were inexperienced. They saw ruin of medical care of their patients, as well as national financial disaster through reckless spending, advancing on the professions and on business institutions. They saw the progressive loss of freedom in a nation dedicated to free enterprise and individual responsibility and incentive. They began to stir and to awaken colleagues and neighbors to their personal responsibility as American citizens. In many communities they, as citizens, took a leading part in elections; in some, their efforts determined the outcome; in others, the medical contribution was a minor but, nevertheless, a significant factor in determining the result of this first battle. The election of Nov. 7 proved that citizens could be aroused by a realization of the increasing regimentation of the nation.

Now, as a citizen, the physician must look about him and try to determine what has happened to him and his fellow citizens that freedom of the individual should thus be threatened. He knows that he is not an economist, nor a statesman, nor a financier, nor a philosopher. But he is deeply interested in human welfare and in both the medical and economic care of the unfortunate. At the same time, he recognizes the danger of moral pauperization in the attempt to relieve physical poverty. He is aware of the conflict between superficially attractive Utopian proposals to "furnish free medical care" to everyone, and the inevitable violation of personal liberty and deterioration of quality of service which will result from their implementation. His medical training has taught him to look behind the symptoms of a disease for the causes which have produced it. He may be unable to determine all the causative factors, but, in any case, he can find some of them and, by their correction, prevent further damage and happily contribute to the recovery of his patient.

THE ILLNESS OF GOVERNMENT

Let us look at the government of our country as a patient. Clearly it is not in good health. What has the patient done to impair his health? What habits has he acquired that have contributed to his present illness? What changes have occurred in his environment, per-

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Read at the Annual Meeting of the Illinois State Medical Society, Chicago, May 23, 1951.

haps, in part, through no fault of his own, that have weakened him? How serious is his sickness? Can he recover? Some of these questions the physician may well refer to his consultants, the statesman and economist. Evidently our national ill health is due to many causes besides the medical. However, some of the early departures from sound thinking involve sociomedical questions, and so it may not be amiss for a physician to recall some of those now forgotten events. Some of the later ones are neither creditable nor palatable. The average man has an extremely limited knowledge of history and a deplorably short memory. One of the chief assets of the demagogue is the proneness of people to believe what they are now told and to forget what really happened a few years before. Our return along the hard road back to sanity and safety may be assisted by a look backward at early and at first unrecognized deviations from right and justice.

ECONOMIC AND SOCIAL CHANGE

Our relations with each other in families, neighborhoods, cities, and in the nation are continually subject to change. With economic changes, population shifts and occupations change. Invention, machinery, and the division of labor have increased the density of population in cities and have created new problems for workers and employers. The cities themselves are undergoing continuous change in the character of their several districts.

But in the effort to remedy old or new defects in our civilization, we must explore carefully the ultimate effects of new social remedies. Such caution is not reactionary; rather, it ensures real progress. Social crises are created when changes in economics are sudden and so widespread that masses of people are unable to adjust themselves to them. At such times, new theories of procedure are suggested, some of which are good; others are bad because the means employed for attempted correction may yield temporary benefits, but later create new distress. Alluring bait is offered in large print; heavy penalties are concealed in small type.

Our nation has survived many political and economic crises since the Civil War. The Greenback era, free coinage of silver, Populism, and the unrest typified by Coxey's Army appeared from time to time as national problems. Each originated in a time of economic stress in a misguided attempt to accomplish a needed reform. Each appealed to an emotionally excited bloc whose leaders were perhaps uninformed of the total effect of their proposals, or else they ignored the national interest to secure personal advantage. Each of these issues was resolved on the basis of national common sense.

In America we withstood the wreckage of postwar inflation which paralyzed some of the nations of Europe. However, we embarked on a program of speculation. Money was mistaken for wealth. Unsound and dishonest procedures crept into business, and as a nation we worshiped Mammon. Substantial business men, enchanted by the vision of easy money, lost their economic poise. Our social values were impaired still more than our economic standards.

The answer came in the financial crash of 1929. This financial disaster was part of a world-wide financial collapse, which in some countries preceded, and in a few, followed, our own. Fortunes of the rich were swept away along with the savings of the thrifty wage earner. Discouragement and frustration pervaded all walks of life. People demanded a change, not caring greatly what its nature might be.

POLITICAL IMMORALITY

At this point our elected governmental officials failed us. They campaigned for economy and yet, when elected, they introduced excessive waste. They sacrified honest action to political advantage. They employed measures which appeared to provide temporary help to the poor and financially distressed man, but at the same time they took away from him his initiative and sense of responsibility to help himself. Many citizens have not even yet recovered their sense of economic and personal responsibility.

To loss of popular respect for law was added loss of governmental respect for the Constitution. When the Supreme Court withheld approval of some New Deal proposals, it was attacked by the administration and the attempt was made to replace its members by those more complacent with the new philosophy. Administrative regulations were devised to circumvent constitutional law. The democracy of our republic, based on the concept of the freedom, dignity, and personal responsibility of the individual citizen, was disregarded.

In 1934 a Cabinet officer stated, "A wonderful opportunity lies ahead of us under our national leadership, not only to consolidate all the social gains to date but to make further substantial advances. . . . It is necessary to modify or even to discard certain social, economic and political concepts appropriate to a pioneer people . . ." In 1945 spokesmen for the Federal Security Administration revealed their program in balder terms, stating that "Social security and public assistance programs are a basic essential for attainment of the socialized state . . ." This statement was reprinted in 1949 and recently again distributed. Distribution is reported to have been discontinued in 1951, only after repeated criticism by the medical profession.

That we have survived thus far is a tribute to the original sturdiness of the nation.

In such an atmosphere, and with such contempt for the principles that our fathers expressed in the Constitution and that we had lived by for 120 years, it is small wonder that economic standards and morality in government and in the lives of the ordinary citizen declined still further. Rigid honesty was replaced by willingness to compromise, and the nation, having lost its guiding compass in domestic matters and, later, in international dealings, was prepared to travel further down the Socialist road.

World War II found us better served technologically than in World War I. We carried on the war successfully, but, because of our moral deterioration, we failed to win the peace. Socialism and communism had infiltrated government departments, and traitors sat in high places. Public confidence in the integrity of government departments was shaken.

SOCIALISTS AND INTELLECTUALS

The significance of intrusions of government into the private lives of citizens by regimentation of a formerly free economy and by a subtle imposition of a planned economy through subsidies is not even now understood by the people. They feel that things are not right, but do not always understand why. Following the well-known pattern of Marxism, Socialist propagandists gathered about them a company of people, some of whom had acquired prominence in their own fields of science or letters but had little real knowledge of the fundamentals of economics or government. To this group, often called the intellectuals, was added a miscellaneous fringe of flabby-minded joiners. Socialism acquired its fellow thinkers as communism had its fellow travellers.

Full-fledged Socialists formed the directing core of the intellectuals and set about molding the opinion of the masses, who were themselves unable to form intelligent judgments. A large proportion of the fellow-thinking intellectuals were equally unqualified to form sound opinions. It sufficed to them to believe that their views were their own, rather than those implanted by their Socialist leaders. They became "second hand dealers in ideas."

"Intellectuals" is a convenient term to describe this coterie, but it should convey no personal connotation of opprobrium other than that many allow themselves to be made the unknowing tools of propaganda to divert public opinion from support of constitutional government. Some, no doubt, derive satisfaction in basking in a fleeting and undiscriminating public acclaim of their pronouncements, the soundness of which is not supported by actual knowledge. While they profess to be liberal they are actually being gullible. They do not intend to be unpatriotic, but their actions appear to belie their plea of patriotism.

EDUCATION OF AMERICAN CITIZENS

The education of our citizenry to the dangers of socialism has already begun and must be continued. Through this education, we, as physicians, may also learn. This is our most important national issue, in which all elements of our national life—manufacturing, banking, business, labor, agriculture, together with medicine and the other professions—are vitally concerned. The very existence of our two-party system, in which we believe, is at stake. We have a right to be proud of our country, its resources, its freedom of the individual, and its Constitution which guarantees this freedom. Our American Constitution is unique and provides opportunity, justice, and freedom to each citizen in a free enterprise system. It was intended to be unique, and, under it, freedom need not "perish from the earth."

We are proud to be citizens under this system. It may have some faults, but under it we enjoy the highest standard of living yet attained in the world. And for this we offer no apology.

We need not cringe at the Communist pronouncement that capitalism and communism cannot coexist in the world. If this be true, then it will not be capitalism and personal freedom that go down. Communism and socialism have within them the elements of revolution and violence which, as in the past, will effect their own downfall.

Some patriotic and relatively well-informed citizens now seem to doubt whether we can ever escape from the domination of bureaucracies which we have allowed to grow up in our government, or, indeed, can long withstand the pressures of our socialistic and communistic enemies. Such faint hearts need only recall the period 1840-1860, when other good people doubted the possibility of abolishing physical human slavery and preserving the Union.

Bureaucratic and socialistic enslavement of the individual can and will be overcome just as surely, but only by a return to fundamental moral and economic principles. Then we shall have more national self respect; more general respect for our Constitution and for the freedom which it provides. Then we can more effectively oppose the evil forces of socialism in its several forms, whose false prophets have brought nations, small and large, to this present critical pass. Then can we successfully assist the forces of humanity and righteousness throughout the nations of the world to relieve misery and to regain their own self-respect and their respect for the dignity and liberty of their individual citizens.

122 S. Michigan Ave.

CLINICAL NOTES

ELECTROSTIMULATION IN RESPIRATORY EMERGENCY

REPORT OF A CASE

Guy Zimmerman Jr., M.D., Warren, Pa.

W. H., a 45 year old white housewife, was admitted for the second time to Warren State Hospital from a city 65 miles distant on June 26, 1950, at 3:45 p. m. On arrival at the hospital she was in a semistuporous state and could not give an intelligible response. The ambulance driver accompanying her likewise was unable to provide any specific information, except that during the trip she seemed to rest quietly and he had heard she had spent the previous night in jail. Data obtained from the patient's previous admission revealed that she was considered neurotic and that she had been alcoholic for 12 years. The first admission was precipitated by a bromide psychosis.

Physical examination revealed a poorly nourished, semiconscious, dehydrated female, who uttered incomprehensible phrases and responded to painful stimuli. Her respiratory rate was 25, temperature 99.6 F. (rectal), pulse rate 80 and blood pressure 110/70. There were numerous abrasions and contusions about the thighs, face and back. Loud rhonchi were heard over both lung bases posteriorly. Heart sounds were good. Neurological examination revealed no cranial nerve involvement. There was no evidence of head injury. Deep reflexes were depressed, but there were no pathological reflexes. Pupillary response was normal. Ophthalmoscopic examination disclosed no abnormalities. The urine was normal except for the albumin content (1+); red blood cells numbered 3,690,000 and white blood cells 10,350. The hemoglobin level was 10 Gm. (60 per cent). The differential count showed 88 per cent polymorphonuclear cells and 12 per cent lymphocytes; blood urea nitrogen was 4.4 mg., blood alcohol 48 mg. and blood bromide 500 mg. per 100 cc.

Continuous intravenous infusions of isotonic sodium chloride solution were started; the patient was given 7½ grains (0.50 Gm.) of caffeine sodium benzoate every four hours and 600,000 units of penicillin every six hours. Her general condition did not seem critical. The following morning, 16 hours after admission, her condition suddenly became worse. The temperature rose to 102

Resident physician, Warren State Hospital, Warren, Pa.

F. (rectal); the pulse became weak, with a rate of 120, and respirations extremely shallow, with a rate of 55. Mottled cyanosis appeared on the face and both upper and lower extremities. There was pronounced respiratory impairment. In the course of one hour she became progressively worse, and death appeared near.

In this situation, a low modulation, alternating electric current varying from 3 to 12 milliamperes was directed through the diencephalic area of the brain, for stimulation of the respiratory center. Dramatic improvement was almost immediately noted. Respirations became deep at 14 per minute. The current was applied for two and one-half minutes. Cyanosis disappeared; deep reflexes returned to normal. During the next 48 hours this procedure was repeated whenever the exigency of the situation demanded, a total of five treatments being administered. After the fifth treatment no further stimulation was needed. Subsequently a typical drug psychosis developed (visual hallucinations, disorientation, fearfulness). Twelve days after admission, the patient was out of bed, rational and completely recovered from her acute episode.

TECHNIQUE

In the above case a low modulation, 3 to 12 milliampere current was directed through the diencephalic area of the brain. The current was delivered by a Reiter electrostimulator (model CW-47). Handle type button electrodes, moistened with isotonic sodium chloride solution, were applied 1 inch (2.5 cm.) directly cephalad to the apex of each ear. The current was initiated at 12 milliamperes and the intensity gradually lowered until a maximum depth of respiratory excursion was obtained. In each treatment session the current was applied for two and one-half minutes, with alternatingly increasing and decreasing intensity during the treatment interval. The instant of greatest stimulating effect seemed to occur at a current varying from 8 to 12 milliamperes, but deep respiratory excursion developed only when the current intensity was decreased to 3 to 5 milliamperes. In other words, a combination of alternating low and high current intensity seemed to produce the optimum effect on respiration. No convulsions resulted from this technique. Two operators are necessary, one to apply and support the electrodes and one to manipulate the controls. It is advisable that additional attendants be present to keep the patient in proper alinement.

COMMENT

Hirschfeld [1] and others have pointed out that modifications of the above electrostimulating technique are useful in the treatment of certain types of schizophrenia and have shown promise in relieving anxiety. An interesting side light evolved from Hirschfeld's work, in that, by modifying his original technique, he achieved a specific antidote for counteracting respiratory depression of barbiturate intoxication.

In the case herein described, after the acute emergency had passed and when historical information became available, it was learned that this patient had consumed an undetermined but large quantity of triple bromides, plus a relatively smaller amount of barbiturates. Also, eight hours after the acute condition, x-ray of the chest confirmed clinical evidence of a beginning pneumonic process in the lower lobe of the right lung. Thus in this case my co-workers and I were confronted with respiratory depression due to drugs (bromides and barbiturates) on which was superimposed an acute infectious process. Although the specific manner in which electrostimulation affects the respiratory center is by no means clear, it was rapidly effective in relieving a dire emergency caused by a combination of factors.

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[1] Hirschfeld, G.: Observations with Nonconvulsive Electrostimulation, read at the American Psychiatric Association, Detroit, May 1-5, 1950.

ROENTGENOLOGIC APPARATUS ATTACHABLE TO THE BELL FRACTURE TABLE

Ray K. Runge,
B. R. Kirklin, M.D.
and
Ralph K. Ghormley, M.D., Rochester, Minn.

Roentgenographic examination of fractures in the operating room with roentgenologic apparatus separate from the fracture table, a method commonly employed, has usually been attended with more or less inconvenience, inaccuracy in duplicating angles of view in a series of roentgenograms, and, if open operation is being performed, hazard of breaking asepsis.

Heretofore, for example, at the Mayo Clinic, a patient having a fracture of the neck or upper portion of the femur was placed on a fracture table with his legs extended and abducted and his feet secured to the foot rests. Then a mobile roentgenographic unit, consisting of a transformer, control stand, and tube stand with tube, was wheeled up to that side of the table corresponding to the injured hip. The tube was centered vertically over the region of the fracture, a loaded cassette was slipped into a tunnel under the hip and a roentgenogram, giving an anteroposterior view, was made. Then the unit was removed to make room for the surgeon.

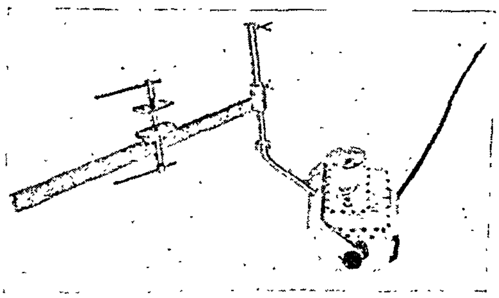

Fig. 1.—Unit 1, with angled post, bar, and clamp, detached from the table.

A second unit, identical with the first, was brought up to the foot of the table. The tube was placed between the patient's outstretched legs near the sound one and directed toward the region of the fracture so as to obtain a lateral view of the break, the cassette being held by an assistant against the patient's hip in a plane perpendicular to the axis of the rays.

Since another series of roentgenograms would be required at the end of the operation, and, perhaps, others

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Helpful suggestions were received from all the consultants in the Section on Orthopedic Surgery during the development of this apparatus.

Technical Assistant (Mr. Runge); from the Section on Roentgenology (Dr. Kirklin) and the Section on Orthopedic Surgery (Dr. Ghormley), Mayo Clinic.

during its course, the second unit was left in place in the hope that the surgeon would not be obliged to move it or the table; additional roentgenograms should be made at the same angle as the first to assure valid comparisons. But often that hope was not realized; the table or tube was displaced, and the unit had to be reset, seldom in exactly the same place or in the same relation to the fracture. If replacement had to be done under a sterile sheet, it was difficult. The inevitable resetting of the first unit, the one used for the anteroposterior view, presented the same difficulties, and, when done during operation, risked contamination of the surgical field. Both units were heavy and occupied considerable floor space, so that they were hard to move about, and, wherever they were placed, they seemed to be in the way.

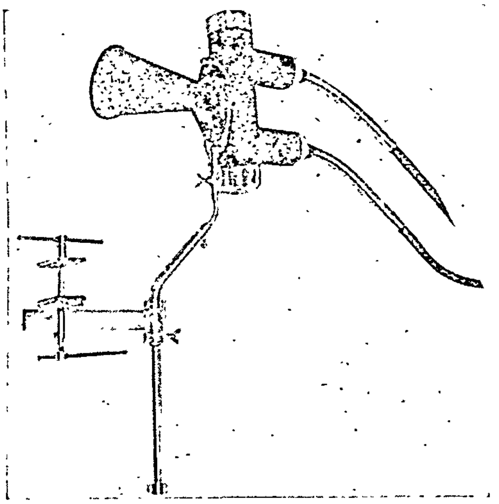

Fig. 2.—Unit 2, with angled post, bar, and clamp, detached from the table.

To obviate or, at least, to diminish these disadvantages and to facilitate the work, we have devised two tube assemblies that can be attached to the Bell table. New unit 1 consists of a standard transformer and small tube head compactly assembled (Fig. 1). It is suspended from the Bell table by an obliquely angled steel post, which is inserted into an eye in a relatively long arm, which, in turn, is inserted horizontally into a slot at the lower end of a bolt that holds together the halves of a steel clamp; this clamp rides between the two bars that constitute the central beam of the table. The clamp can be removed and placed elsewhere in the beam as desired. All connections are adjustable and can be locked by wing nuts or levers. This adjustability, together with the angulation of the supporting post, permits setting the unit at any position within a wide range. From the unit, a long, flexible cable, which carries primary current only, extends to a control-stand that operates both unit 1 and unit 2. As the new unit 1 is set immediately below the field of operation, it usually becomes soiled, so it is covered with plastic material that can be cleaned easily.

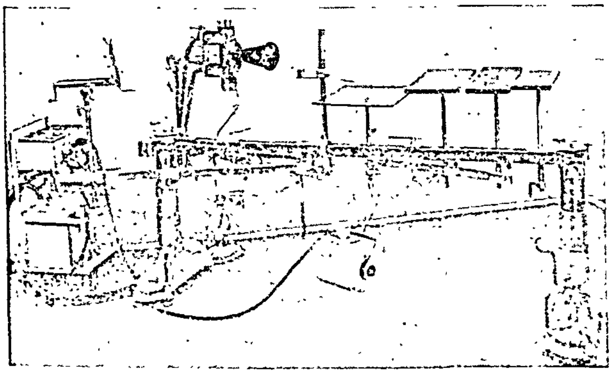

Fig. 3.—Bell table with both units attached to the table and connected with the mobile control-transformer stand.

Application of the new unit 1 differs from that of the old in that the new one is used to obtain a posteroanterior view of the fracture instead of the reverse. Accordingly, in the instance of a broken hip, the unit is set directly beneath the site of fracture, at the usual distance of 36 in. (91 cm.) from the cassette, which is laid on the patient's thigh, sterile towels or bags being used for protection as needed.

The new unit 2 consists of a small shockproof tube head with slightly modified cable connections (Fig. 2). Like unit 1, it is mounted on an obtusely angled post, and its connections with the table are the same as those of unit 1 except that the horizontal bar into which the post is inserted is short. All connections can be adjusted to suit, and locked. The tube is connected with the mobile control-transformer stand by long flexible cables that carry high-tension current only. With its many adjustable mountings, this unit, like its fellow, can be set in almost any position desired (Fig. 3).

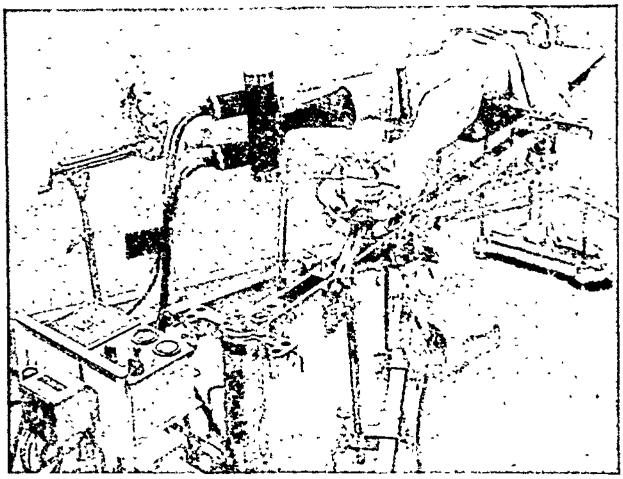

Fig. 4.—Apparatus attached to the Bell table; the patient is in position for posteroanterior and lateral roentgenography of the upper end of the femur.

In cases of fracture of the neck of the femur, for instance, unit 2 is set as close as possible to the internal aspect of the patient's sound leg, the small size of the new tube head giving it an advantage in this respect over the old (Fig. 4). The cone is directed toward the fracture for a lateral view, the cassette being held by an assistant against the hip and transversely to the axis of the rays at a target-film distance of 36 in. (91 cm.). The tube is left in place during the operation. It is so small that the surgeon is not likely to come into accidental contact with it or ask for its removal. If it does become necessary to remove the unit, the post can be inserted temporarily into one of the tubular front legs of the control stand.

Later, if further lateral views are required, the tube can be restored to its original position, and the angle of roentgenography will duplicate or closely approximate the original angle, because the patient, table, and roentgenologic unit will be in the same relation as before.

This assurance that successive views, both posteroanterior and lateral, will be made at or very near the same angle as the original, regardless of temporary changes of position, thus making comparisons reliable, is perhaps the most outstanding advantage of the new installation over the old. But there are other advantages, some of which have been mentioned in passing. Repetition of the posteroanterior view does not threaten contamination of the surgical field. The small size of unit 2 makes positioning for the lateral view easier and better. Both units, when set, are out of the way and are not likely to be pushed out of focus during operation. Since the units are attached to the table, the latter can be moved without disturbing relations. The units are much lighter than the old and can be removed, replaced, or shifted about with ease. When not in use, the control-transformer stand, with the posts of both tube units inserted into its tubular posts, occupies a floor space of only 15 in. by 16 in. (38 cm. by 40.6 cm.) so that the entire apparatus can be parked without taking up an undue amount of room (Fig. 5). The cost of the new units is comparable to that of the old.

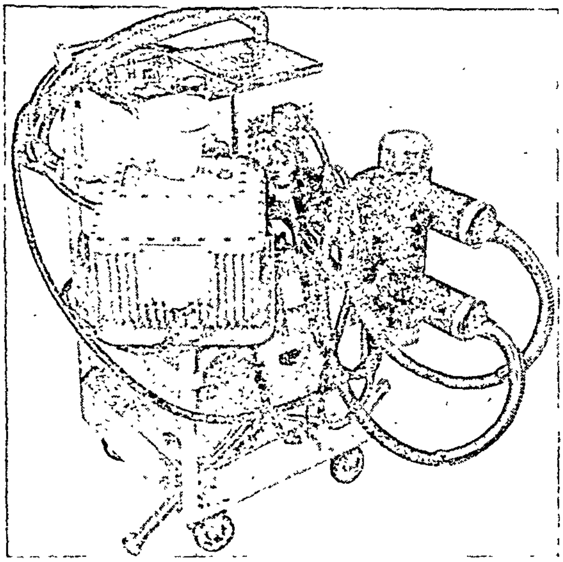

Fig. 5.—Both units mounted on the mobile control-transformer stand for storage.

Advances in Preventive Medicine.—During World War II, military preventive medicine reached a high state of development. This great conflict was the first one in history that was not followed by major epidemic diseases. In the Army alone, more than 10,000,000 men were mobilized to serve in some of the most unhealthful regions of the world, but their health was so well protected that the disease rates were lower than in any of our former wars. There were no serious epidemics, and the disease death rate was only 0.6 per thousand per year. This figure is low compared with the rate of almost 16 per thousand during World War I, and the still higher rate of 25 per thousand during the Spanish-American War.—James Stevens Simmons, M.D., *New England Journal of Medicine,* May 10, 1951.

COUNCIL ON FOODS AND NUTRITION

REPORT TO THE COUNCIL

The Council has authorized publication of the following report prepared by William B. Castle, C. A. Elvehjem, Charles D. May, Arnold D. Welch, Wolf W. Zuelzer, and Allan M. Butler. These men participated in the first of a series of conferences among active investigators on problems of infant nutrition held at the Massachusetts General Hospital on Nov. 16, 1950. Among the topics considered were (1) fundamental actions of vitamin B_{12} and folic acid, (2) distribution of these vitamins in foods, (3) the clinical evidence of deficiencies, and (4) the interrelations of vitamin B_{12}, folic acid, citrovorum factor, and ascorbic acid. JAMES R. WILSON, M.D., *Secretary.*

VITAMIN B_{12} AND FOLIC ACID IN INFANT NUTRITION

Perhaps the most important practical result of the deliberations of this conference was the emergence of a tentative attitude regarding the adequacy of vitamin B_{12} and folic acid in the milk diets customarily fed the growing infant from birth. Evidence was presented indicating that, after lactation is fully established, woman's milk contains between 0.1 and 1.0 microgram of vitamin B_{12} and folic acid per liter.[1] Cow's milk was reported to contain slightly more folic acid and definitely more vitamin B_{12} than human milk. Although there is some natural variation between samples, the conferees agreed that infants being fed artificially with cow's milk formulas would receive as much vitamin B_{12} and folic acid as the breast-fed infant, because these formulas usually contain 50 to 70% cow's milk. Thus, there would not seem to be any urgent need to supplement, with vitamin B_{12} or folic acid, the diet of normal infants being fed cow's milk.

The group attending this conference did not believe there was evidence of widespread deficiency of vitamin B_{12} and folic acid among infants and children as revealed by megaloblastic anemia or suboptimal growth. A cautious attitude was assumed toward employment of vitamin B_{12} or folic acid in an attempt to augment the normal growth of healthy infants being fed either artificially or by a well-nourished mother. Any studies claiming improved growth in normal children from supplementary vitamin B_{12} or folic acid will have to be appraised critically.

Certain pathologic conditions leading to reduced intake or impaired assimilation in infants might increase the need for these vitamins, but the therapeutic requirements of abnormal infants should not be confused with, or extended to, the requirements of normal infants. One of the conferees aptly expressed this distinction by stating that deficiency of vitamin B_{12} or folic acid was more likely to result from abnormalities within the individual child than from inadequate intake, because a proper diet, as now conceived, would provide amounts of vitamin B_{12} and folic acid which we have no reason to consider inadequate. The group did not feel that evidence presented justified widespread prophylactic use of vitamin B_{12} or folic acid in order to meet the extra requirements of the occasional pathologic situation.

The interdependence of requirements of vitamins was exemplified by the role of ascorbic acid in the requirement of folic acid. When adequate ascorbic acid is available, the normal infant's need for folic acid appears to be satisfied by the small amounts normally present in milk. If there is a deficiency of ascorbic acid, the amount of folic acid required to prevent megaloblastic anemia is considerably increased.

Carefully controlled studies of growth as well as the incidence of megaloblastosis would be helpful in detection of the circumstances that may lead to a deficiency of vitamin B_{12} or folic acid. Other indexes are also needed. Further studies of the role of the intestinal flora in the requirements, provision, and metabolism of vitamin B_{12} and folic acid would be beneficial. The role of gastric factor in the absorption of vitamin B_{12} in infancy must be determined before the adequacy of the intake of vitamin B_{12} can be evaluated from the content of the diet alone. The discussion of the fundamental metabolism of vitamin B_{12} and folic acid indicates that a final attitude toward the requirements of these vitamins in the diet will have to await a more complete understanding of their relationship. Folic acid appears to serve as a precursor of a biologically more active form (citrovorum factor or folinic acid). Ascorbic acid enhances the production of this factor from folic acid. The evidence does not indicate that vitamin B_{12} is critically involved in the conversion of folic acid to citrovorum factor, but it could be concerned with the subsequent formation, from this factor, of another metabolically significant compound.

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[1] The mean figure used was 0.41 microgram for vitamin B_{12} and 0.71 microgram for folic acid.

A valid reason probably will be found for the natural provision of these potent vitamins in small amounts and in the ratio in which they occur in milks. Then we may be rewarded for a conservative approach and the avoidance of promiscuous use of these vitamins which play such a vital role in basic cellular growth and metabolism.

ACCEPTED FOODS

The following products have been accepted as conforming to the rules of the Council.

JAMES R. WILSON, M.D., *Secretary.*

Armour and Company, Chicago, Distributed by Gerber Products Company, Fremont, Mich.

GERBER-ARMOUR STRAINED BEEF HEARTS is made from meats (trimmed of fat, sinews and connective sheaths) with added salt, prepared under inspection of the Meat Inspection Division of the United States Department of Agriculture.

Analysis (submitted by manufacturer).—Total solids 18.7%, moisture 81.3%, ash 1.2%, fat 4.0%, protein (N × 6.25) 14.0%, carbohydrates (none).

Vitamins and Minerals	Mg./100 Gm.
Thiamine	0.041
Riboflavin	0.710
Nicotinic acid	4.35
Calcium	6.0
Phosphorus	121
Iron	3.0

Calories.—0.92 per gram; 26.1 per ounce.

Use.—For use in the feeding of infants, convalescents and others requiring a soft diet.

GERBER-ARMOUR STRAINED PORK is made from meats (trimmed of fat, sinews and connective sheaths) with added salt, prepared under inspection of the Meat Inspection Division of the United States Department of Agriculture.

Analysis (submitted by manufacturer).—Total solids 21.3%, moisture 78.7%, ash 1.1%, fat 5.1%, protein (N × 6.25) 14.6%, carbohydrates (none).

Vitamins and Minerals	Mg./100 Gm.
Thiamine	0.23
Riboflavin	0.21
Nicotinic acid	3.0
Calcium	8.0
Phosphorus	116
Iron	1.0

Calories.—1.04 per gram; 29.5 per ounce.

Use.—For use in the feeding of infants, convalescents and others requiring a soft diet.

The Borden Company, New York.

BIOLAC-MODIFIED POWDERED MILK. Ingredients: Whole milk, skim milk, milk sugar, concentrates from cod liver and fish liver oils (containing natural vitamin A), vitamin D, thiamine hydrochloride U. S. P., and ferric citrate U. S. P.

Analysis (submitted by manufacturer).—Total solids 98.0%, moisture 2.0%, minerals 4.3%, fat 20.2.%, protein 20.2%, lactose 53.3%.

Vitamins and Minerals	Per 100 Gm.	
Vitamin A	1,800	U.S.P. units
Vitamin D	290	U.S.P. units
Thiamine	0.18	mg.
Riboflavin	1.4	mg.
Calcium	610	mg.
Phosphorus	500	mg.
Iron	6	mg.

Calories.—4.8 per gram; 136 per av. oz.; 39.0 level tablespoon.

Use.—For use in infant feeding.

BREMIL POWDERED INFANT FOOD. Ingredients: Skim milk, lactose, palm oil, cocoanut oil, peanut oil, lecithin, calcium chloride, methionine D-L, ferrous sulfate, ascorbic acid, nicotinic acid, thiamine hydrochloride, riboflavin, vitamin A, vitamin D and potassium hydroxide.

Analysis (submitted by manufacturer).—Total solids 97.7%, moisture 2.3%, ash (minerals) 3.9%, fat 27.5%, protein 11.7%, carbohydrate 54.6%.

Vitamins and Minerals	Per 100 Gm.	
Vitamin A	2,570	U.S.P. units
Vitamin D	643	U.S.P. units
Thiamine	0.3	mg.
Riboflavin	0.8	mg.
Nicotinic acid	4.8	mg.
Ascorbic acid	24.0	mg.
Iron	6.4	mg.

Calories.—5.1 per gram; 144.6 per ounce; 44 per level tablespoon.

Use.—For use in infant feeding.

The H. J. Heinz Company, Pittsburgh.

HEINZ JUNIOR CHICKEN SOUP. Ingredients: Dressed chickens, rice, whole milk powder, flour, carrots, 50% cream, celery, onions, dried yeast, monosodium glutamate and salt in sufficient water to prepare properly.

Analysis (submitted by manufacturer).—Total solids 11.72%, moisture 88.28%, ash 1.03%, fat (by acid hydrolysis) 2.25%, protein (N × 6.25) 1.94%, crude fiber 0.06%, carbohydrates other than crude fiber (by difference) 6.40%, total sugar as sucrose 0.70%.

Vitamins and Minerals	Mg./100 Gm.
Thiamine	0.074
Riboflavin	0.100
Nicotinic acid	0.81
Calcium	31.0
Phosphorus	23.0
Iron	0.13
Copper	0.11

Calories.—0.55 per gram; 15.2 per ounce.

Use.—For use in the feeding of older infants and young children.

HEINZ JUNIOR MACARONI, TOMATOES, BEEF AND BACON. Ingredients: Macaroni, beef chuck, flour, 50% cream, carrots, sugar, tomato solids, bacon, dried yeast, whole milk powder, celery, onions, beef extract and salt in sufficient water necessary for preparation.

Analysis (submitted by manufacturer).—Total solids 16.49%, moisture 83.51%, ash 1.50%, fat (acid hydrolysis) 2.32%, protein (N × 6.25) 2.76%, crude fiber 0.19%, carbohydrates other than crude fiber (by difference) 9.72%, total sugar as sucrose 2.61%.

Vitamins and Minerals	Per 100 Gm.	
Vitamin A activity	470	I.U.
Thiamine	0.331	mg.
Riboflavin	0.146	mg.
Ascorbic acid	1.32	mg.
Nicotinic acid	1.41	mg.
Calcium	19.0	mg.
Phosphorus	25.0	mg.
Iron	0.68	mg.
Copper	0.3	mg.

Calories.—0.71 per gram; 20 per ounce.

Use.—For use in the feeding of older infants and young children.

Mead Johnson and Company, Evansville, Ind.

PABLUM BARLEY CEREAL. Ingredients: Barley flour, powdered beef bone, sodium chloride, dried yeast and iron.

Analysis (submitted by manufacturer).—Total solids 93.0%, moisture 7.0%, ash 4.4%, fat (ether extract) 0.3%, protein (N × 6.25) 10.5% crude fiber 0.7%, carbohydrates (other than crude fiber by difference) 77.1%.

Vitamins and Minerals	Mg./100 Gm.
Thiamine	1.06
Riboflavin	0.35
Calcium	770
Phosphorus	650
Iron	30
Copper	1

Calories.—3.5 per gram; 100 per ounce.

Use.—For use in the feeding of infants and young children, and for convalescents requiring a soft diet.

PABLUM RICE CEREAL. Ingredients: Rice flour, powdered beef bone, sodium chloride, iron, thiamine hydrochloride, riboflavin and nicotinamide.

Analysis (submitted by manufacturer).—Total solids 92.0%, moisture 8.0%, ash 3.8%, fat (ether extract) 0.2%, protein (N × 6.25) 6.0%, crude fiber 0.3%, carbohydrates other than crude fiber (by difference) 81.7%.

Vitamins and Minerals	Mg./100 Gm.
Thiamine	1.41
Riboflavin	1.06
Nicotinic acid	14.1
Calcium	790.0
Phosphorus	530.0
Iron	30.0
Copper	0.6

Calories.—3.5 per gram; 100 per ounce.

Use.—For use in the feeding of infants and young children, for convalescents requiring a soft diet, and for diets in allergies.

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THE BIOSYNTHESIS OF CITRIC ACID

During the past decade, citric acid, long known to be a constituent of many body tissues and fluids, has come into prominence in the medical sciences as an important member of a catalytic cycle involved in the final cellular oxidation of carbohydrates, proteins, and fats, which is frequently termed the "Kreb citric acid cycle." The need for information concerning the biosynthesis of citric acid has thus, in turn, become important. Considerable progress has been made recently in phases of this problem pertaining to precursors and enzymes.

One of the first investigations bearing on the precursors of citric acid was that of a Yale group,[1] who found that the intravenous administration of the sodium salts of either malic, fumaric, or succinic acids was followed by a pronounced increase in citric acid in the urine, indicating that these substances served as citrate precursors. The Yale workers suggested chemical steps whereby the synthesis of citric acid from the above acids could occur. The above results, together with others, were incorporated by Krebs [2] into the now well-known "citric acid cycle." Krebs postulated that malic acid was converted to oxalacetic acid by the loss of two hydrogen atoms and that this then combined with pyruvic acid to form a seven-carbon intermediate compound, which then was converted to citric acid. Subsequent work, however, indicated that a two-carbon fragment, probably acetyl phosphate, combined with the oxalacetic acid directly to form citric acid. This has currently been verified with the use of oxalacetate labeled with radioactive carbon 14 [3] and by enzymatic studies with the use of acetate and oxalacetate.[4] The present concept that citric acid is synthesized from an acetyl group and oxalacetate is of considerable importance, since these two substances, in turn, arise from the metabolic breakdown of carbohydrates, fats, and proteins in the body. The concept of citric acid as a key intermediate in the "final common pathway" of catabolism is thus supported.

Other recent work has contributed to the elucidation of the enzymatic mechanism by which citric acid is synthesized in vivo. The results from several laboratories [5] have indicated that coenzyme A, formed from pantothenic acid, is involved in the biosynthesis of citric acid. Tissues from pantothenic-acid-deficient animals or yeast grown in a pantothenic-acid-deficient medium showed a decided reduction in ability to form citric acid from its precursors. Recently, the classical work of Ochoa and his group [6] at New York University has demonstrated the need of several other factors in the biosynthesis of citrate. One is a "condensing enzyme," which these investigators have isolated in crystalline form.[6a] Other factors concerned [6b] include magnesium ions, adenosine triphosphate, and, of course, the direct precursors, the acetyl group and oxalacetate, and coenzyme A.

These fundamental studies at once assume practical significance in this day of possible atomic warfare. A current report [7] indicates that there is a decided inhibition of citric acid synthesis in certain tissues of animals subjected to x-irradiation, presumably by way of the inactivation of the enzymatic mechanism of synthesis. This observation may well explain, in part at least, the damaging effects of certain types of radiations on tissues, inasmuch as the cells of these tissues are dependent for their viability on the energy released from the oxidation of metabolites by way of the citric acid cycle.

DIGITALIS AND POTASSIUM

A recent report by Lown, Salzberg, Enselberg, and Weston [1] throws further light on the long-recognized relation between potassium metabolism and the cardiac effects of digitalis. Ten patients in congestive heart failure served as subjects in this investigation. The threshold of mild toxicity to rapidly acting cardiac glycosides was determined during a control period and following procedures designed to induce a depletion of potassium. Criteria of toxicity were based on electrocardiographic findings of ventricular extrasystoles, impairment of auriculoventricular conduction, or alterations in the pacemaker. The gross potassium balance was determined by changes in urinary potassium excretion. One of four patients given mercurial diuretics after pretreatment with ammonium chloride showed an increased urinary potassium excretion and an increased sensitivity to acetyl strophanthidin, while two others showed no significant change in potassium excretion and no signs of digitalis poisoning. In the fourth patient, the threshold for ouabain toxicity after mercurial diuretics was greatly increased when potassium citrate was administered. Again, severe toxic symptoms followed therapy with mercurial diuretics in a patient on a constant maintenance dose of digoxin. Signs of toxicity did not develop, however, if potassium citrate was administered on days when the diuretic was given. Two patients depleted of potassium by vomiting,

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diarrhea, and malnutrition appeared to be markedly sensitive to acetyl strophanthidin, though the serum potassium was significantly lowered in only one. In another patient, signs of digitalis toxicity could be abolished by oral potassium and reintroduced by mercurial diuresis. Nine days after the digitalis preparation was discontinued, mercurial diuretics failed to elicit digitalis toxicity. However, administration of insulin and glucose resulted in a decrease in serum potassium and the development of severe digitalis toxicity, which was abolished by potassium citrate. After the digitalis had been withheld for six weeks, glucose and insulin failed to induce signs of toxicity.

Since no significant changes in serum (or extracellular) potassium were observed in eight of the 10 patients, the authors concluded that the observed increased sensitivity to cardiac glycosides probably results from alterations in intracellular potassium distribution. That the effects are not due to simultaneous changes in distribution of water and electrolytes other than potassium is indicated by preliminary studies in which these variables were controlled. With the use of an artificial kidney, digitalis poisoning was induced by selective removal of potassium and abolished by restoration of the removed potassium. The results reported by Lown and his associates not only indicate that depletion of potassium increases the sensitivity of the heart to digitalis but suggest that the clinically observed increased sensitivity to digitalis in such conditions as acute myocardial infarction, pulmonary embolism, and acute infections may be due to the negative potassium balance which is a part of the bodily response to acute stress.

SYPHILIS CONTROL

The statement is heard with increasing frequency that syphilis is a vanishing disease. Many feel that penicillin therapy plus a continued nationwide program of case finding and education will soon relegate syphilis to the minor status of smallpox, typhoid and diphtheria. Others adopt a more conservative attitude. In a penetrating analysis, Moore [1] points out that the long term trends in the incidence of syphilis have not been altered dramatically by antibiotic therapy and that the ultimate goal of eradication may be more distant than the optimistic would have us believe.

Available data indicate that there has been a steady decrease in the incidence of syphilis in Europe and the United States for almost a century and that this decline has been interrupted only by temporary increases in morbidity during wars or periods of civil unrest. Two observations provide clues as to the mechanism of this decline: 1. It began long before the discovery of specific therapy for syphilis or the institution of public health measures for its control. 2. It has been accompanied by a progressive decrease in the acuteness of the disease, so that an infection that was often rapidly fatal in the 15th century has evolved into one of great chronicity. These observations suggest that a gradual process of adaptation has led to a decrease in the virulence of the parasite or an increase in the resistance of the host. In addition, there is evidence that the progressive improvement in socioeconomic conditions in Western civilization has contributed to the reduction in the incidence of syphilis. Whatever the mechanisms responsible for the decrease in morbidity before the days of specific therapy, it may be assumed that they are still operative and that they may be at least partially responsible for the continued decline.

Since the introduction of specific arsenical therapy in 1910, the rate of decline seems to have been accelerated somewhat. It is difficult to make precise statements because of the incompleteness of the available data and the tendency of the periodic fluctuations in the incidence of syphilis to obscure the long-range trends. It is even more difficult to evaluate the effect of a relatively new drug such as penicillin on the curve of incidence, since the total duration of penicillin therapy has not yet exceeded one of the naturally recurring cycles of increase and decrease in the incidence of the disease. It is tempting to attribute the sharp decrease in the attack rate in the past three or four years to the widespread use of penicillin, but the fact cannot be ignored that a decline at exactly the same rate occurred after World War I, before the discovery of penicillin. At least another decade of experience with penicillin will be required before its effect on the incidence of syphilis can be measured accurately. Its value in the control of the individual case of syphilis remains unchallenged, however. It is to date the drug of choice in this disease—effective, rapidly acting, nontoxic, and inexpensive.

A factor of equal or greater importance in the accelerated decline in the incidence of syphilis has been the application of modern public health measures to the control of venereal disease. Public health authorities in this country and in Europe have accomplished a prodigious task in finding and treating millions of infected persons and in educating the public. Their efforts are reflected in the continuing decrease in the infant and adult morbidity and mortality from syphilis.

According to Moore, however, the present rate of decline is not yet sufficiently significant (except possibly in Scandinavia) to promise eventual complete control in any country, to permit a relaxation of control efforts or to set a time limit on the achievement of the desired goal. In this country in 1949, there were still an estimated 3,000,000 persons with serologic evidence of infection with syphilis,[2] and an additional 150,000 persons acquired the infection in that year. Fourteen thousand syphilitic infants were born and 13,000 persons died of syphilis in the same year. Six thousand persons were sent to mental institutions because of syphilis. These figures continue to decrease, but past experience has shown that eradication of a disease in one country is not enough. The continual population exchanges permitted by modern transportation make new epidemics possible as long as an endemic focus remains anywhere in the world. Densely populated China and India have a high incidence

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2. Aufranc, W. H.: Are Venereal Diseases Disappearing? Over-All Picture Throughout the Country, Am. J. Syph., Gonor. & Ven. Dis. 35: 135 (March) 1951.

of syphilis, and these countries constitute a potential public health danger.

Moreover, as Moore points out, no infectious disease in the history of medicine has been eradicated or even partially controlled by the sole process of treatment of infected persons. Immunization may be the ultimate goal of public health control, but this in turn awaits further research on the problem of cultivation of the Treponema pallidum. Both public and private laboratories are doing their utmost to solve this problem, but financial support is needed. In the long run this type of approach is the most economical one, because global control by present methods is a practical impossibility.

MUSCULAR CONTRACTION

Muscle tissue accounts for about 40% of the mass of the body; it is obvious, therefore, that the pattern of metabolism of muscle dominates that of the body as a whole. The characteristic chemical reaction of the muscle—oxidation with the production of heat—is looked on as typical of that of the body as a whole. Of the muscle mass, about 80% of the solids is accounted for by proteins, which have long been looked on as possessing unique properties, both chemical and physical. The transformation of energy which is evolved in the course of glycolysis in muscle to mechanical work produced by the muscle is a phenomenon that is yet only partly understood. However, recent studies of muscle proteins themselves, along with the adaptation of new physical techniques, have greatly facilitated a better understanding of the intricate physical chemistry of muscular contraction.

An early suggestion of the unusual properties of muscle protein arose from the observation of Engelhardt and Ljubimowa,[1] who reported that the globulin of muscle could release phosphoric acid from adenosinetriphosphate. In other words, the protein fraction soluble in salt solution (myosin) exhibited enzymatic activity and this activity could not be separated from the protein itself. This observation has been confirmed by many investigators, although it has been held[2] that the enzymatic activity can be separated from the muscle globulin and, also, that there are other adenosinetriphosphatases than myosin.[3] The significance of the enzymatic degradation of adenosinetriphosphate by muscle protein is that the release of a relatively large amount of energy is thereby brought about; this chemical energy is involved in the contraction of the muscle.

The beginning of the newer concept of the functional activity of muscle proteins was discovery[4] that a constituent of the muscle stroma (actin) combines with the globulin myosin to form the protein complex known as actomyosin and that it is this complex that is the contractile unit in muscle tissue. The actin itself as well as the actomyosin complex can exist in molecules of globular form and also of fibrous form, and it appears that inorganic salts are required to promote the change of globular actomyosin to the fibrous form and that adenosinetriphosphate, likewise, is necessary for this transformation.[5] With the use of the electron microscope, F-actin was observed to form from G-actin; these fibers were long and 100 A thick and show conspicuous cross striations,[6] which fact may account for the changes in flow birefringence early seen when myosin reacts with adenosinetriphosphate.[7]

On the basis of the data currently available, it appears that the relaxed muscle is rich in energy and that G-actin and the complex of myosin and adenosinetriphosphate coexist in the dissociated form; on stimulation and in the presence of magnesium and potassium ions (among others) and of adenosinetriphosphate, G-actomyosin is formed which is still enzymatically inactive. There is a rapid change from G-actomyosin-adenosinetriphosphate to F-actomyosin-adenosinetriphosphate in the presence of salts and with the evolution of energy; the F-actomyosin is contractile in this energy-poor state and becomes enzymatically active, yielding energy which is absorbed by the system in reestablishing the high energy level of the relaxed muscle in which G-actin and myosin-adenosinetriphosphate are again separated. In this scheme, the energy appears to be used in the reestablishment of the energy-rich relaxed muscle, not for the contraction of the fibers of actomyosin. The need for further clarification of the intimate details of the process is apparent; with such conditions as myasthenia gravis and other muscular dystrophies in mind, it is plain that the rewards of a better understanding of muscular contraction will be enormous.

OPIATES AND PANCREATIC ENZYMES

Elevated levels of serum amylase and lipase are generally regarded as reliable evidence of pancreatic disease. Recent work, however, has demonstrated that the serum concentration of these enzymes may rise following the administration of opiates in the absence of pancreatic disease. In the course of studies on pancreatic function, Burke and co-workers[1] observed an increase in serum amylase in three patients without evidence of pancreatic disease following the subcutaneous injection of 16 mg. of morphine sulfate. At about the same time Gross and associates[2] observed elevated serum amylase and lipase levels following opiate administration in a patient whose pancreas appeared normal at the time of exploratory laparotomy. Suspecting that the opiate was responsible, they gave the patient 0.13 gm. of codeine sulfate hypodermically on two subsequent occasions and each time observed a pronounced rise after the injection. The amylase levels remained elevated for 24 hours. Extending their studies, they obtained similar results in five additional patients with biliary dyskinesia, but without evidence of pancreatic disease, and in one patient with penetrating duodenal ulcer. Twenty-one other patients with various diseases of the liver, gallbladder, stomach, and pancreas did not show this phenomenon.

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The mechanism of this reaction is not entirely clear, but presumably morphine and its derivatives induce a spasm of the sphincter of Oddi, which in certain individuals who are anatomically [1] or allergically [2] predisposed results in an increase in pancreatic intraductal pressure and a reflux of enzymes into the blood stream. Regardless of the mechanism, it is apparent that this reaction, when it occurs, is a potential source of error in the clinical interpretation of elevated serum enzyme values. Often patients who are suspected of having pancreatitis are given morphine or codeine before blood is obtained for enzyme determination. In such circumstances, it is well to keep in mind that the serum enzyme levels may be altered by the opiates.

ULTRASONICS IN DIAGNOSIS

Because of their ability to penetrate tissues, high frequency acoustic vibrations have found both diagnostic and therapeutic applications in medicine. Until recently the therapeutic applications have received major emphasis. The thermal, mechanical, and chemical changes produced by ultrasonic vibrations as they pass through tissues have been utilized in the treatment of a great variety of diseases,[1] chiefly in Europe. Good results have been reported, but unfortunately most of the therapeutic evaluations have been based on clinical impressions alone and few controlled observations have been made. As a result, very little accurate scientific information on the therapeutic effectiveness of ultrasound has been obtained. The current studies of Nelson and co-workers [2] offer promise of correcting this situation.

In the last few years, increasing attention has been focused on the use of ultrasound in diagnosis. It has been found that alterations in the density or elasticity of a tissue can be detected with the aid of ultrasonic waves. Two approaches are available. In one, the tissue is exposed to the waves and the ultrasonic echoes returning to the surface are studied; in the other, the ultrasonic energy passing through the tissue is measured. The first method is an adaptation of a technique used for years in industry for the detection of flaws in metal castings and in navigation for depth sounding. It is based on the principle that ultrasonic waves passing through a medium are reflected back to the source as echoes when they encounter a surface (interface) of changing density within the medium. Thus, when the waves strike a tumor, a foreign body, or a collection of fluid within a tissue, some of them are reflected back to the surface as echoes. The intensity and character of the echoes give clues as to the consistency of the lesion, and the time required for the echoes to return to the surface gives an indication of the depth of the lesion. Using this technique, Ludwig and Struthers [3] have been able to detect gallstones and foreign bodies in animal tissues, and more recently French, Wild, and Neal [4] have reported the accurate localization of intracerebral neoplasms in a human brain removed immediately after death. Wild and Neal [5] have also reported distinguishing between carcinomatous and noncarcinomatous tumors of the breast by this method in two patients. The ultrasonic vibrations employed in the last two experiments were generated, transmitted, and received by a small instrument (ultrasonoscope), no larger than the bell of a stethoscope, that could easily be applied to any part of the body surface. Such an ultrasonoscope consists of a small metal chamber containing a piezoelectric crystal capable of converting high frequency electrical impulses into high frequency (15,000,000 cycles per second) mechanical vibrations. This crystal, activated intermittently by an electronic oscillator, sends pulses of ultrasonic energy into the tissues and receives the returning echoes during its quiescent period. These are reconverted by the crystal to electrical impulses that are recorded by a synchroscope. The final tracing appears as a series of waves resembling an electrocardiogram.

In the second diagnostic technique mentioned, separate transmitting and receiving crystals are placed on opposite sides of the tissue to be examined and the relative transmission of ultrasonic vibrations by different areas of tissue is measured. Since this transmission depends on the density, elasticity, homogeneity, and viscosity of the medium, variations in transmission indicate variations in texture of the tissue. By this method, Dussik [6] and Ballantine and associates [7] have obtained ultrasonic ventriculograms without air injection in living subjects and Denier [8] has detected intracranial foreign bodies in animals. In both the echo technique and the selective transmission method, ultrasonic vibrations of such short duration and low intensity are used that no symptoms are produced and no tissue alterations are detectable.[9] While both diagnostic methods are still capable of technical refinement, the results already obtained are definitely encouraging. These are fascinating developments that will bear watching.

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2. Nelson, P. A.; Herrick, J. F., and Krusen, F. H.: Temperatures Produced in Bone Marrow, Bone and Adjacent Tissue by Ultrasonic Diathermy: Experimental Study, Arch. Phys. Med. **31:** 687 (Nov.) 1950.

3. Ludwig, G. D., and Struthers, F. W.: Considerations Underlying the Use of Ultrasound to Detect Gallstones and Foreign Bodies in Tissue, Report No. 4, Nav. M. Research Inst. Project NM004001 (June 16) 1949, cited by Nelson.[1]

4. French, L. A.; Wild, J. J., and Neal, D.: Detection of Cerebral Tumors by Ultrasonic Pulses: Pilot Studies on Postmortem Material, Cancer **3:** 705 (July) 1950.

5. Wild, J. J., and Neal, D.: Use of High Frequency Ultrasonic Waves for Detecting Changes of Texture in Living Tissues, Lancet **260:** 655 (March 24) 1951.

6. Dussik, K. T.; Dussik, F., and Wyt, L.: Auf dem Wege zur Hyperphonographie des Gehirnes, Wien. med. Wchnschr. **97:** 425 (Oct. 4) 1947.

7. Ballantine, H. T., Jr.; Bolt, R. H.; Hueter, T. F., and Ludwig, G. D.: On the Detection of Intracranial Pathology by Ultrasound, Science **112:** 525 (Nov. 3) 1950.

8. Denier, A.: Essai de Détection de Masse Tumoral du Cerveau par Ultra-Sonoscopie, Compt. Rend. Soc. Biol. **140:** 763 (Oct.) 1946.

9. Ballantine, Bolt, Hueter and Ludwig.[7] French, L. A.; Wild, J. J., and Neal, D.: The Experimental Application of Ultrasonics to the Localization of Brain Tumors, J. Neurosurg. **8:** 198 (March) 1951.

ORGANIZATION SECTION

THE SCIENTIFIC EXHIBIT, LOS ANGELES CLINICAL SESSION

The Clinical Session of the American Medical Association will be held in Los Angeles, Dec. 4 to 7, 1951, at which time the Scientific Exhibit will again be one of the outstanding features. It is planned to have the Scientific Exhibit located on the balcony floor of the Shrine Convention Hall, easily reached by stairways from the Technical Exposition on the first floor and connecting with Al Malaikah Temple, in which will be located the lectures, clinical presentations, television, and motion pictures.

There will be special exhibits on fractures, on overweight, nutrition and health, and on noise in industry, presented by the various special exhibit committees. Groups of exhibits on cancer, diabetes, and heart disease will be well developed with the advice and cooperation of specialists in those subjects. Groups of exhibits on obstetrics and gynecology, pediatrics, internal medicine, surgery, dermatology, and miscellaneous subjects will be given prominent attention. While the interests of the specialist will not be overlooked, the main emphasis of the exhibit will be placed on the teaching value for the physician in general practice.

The Committee on Scientific Exhibit includes E. J. McCormick, M.D., Toledo, Ohio, Chairman; L. W. Larson, M.D., Bismarck, N. D., and Thomas P. Murdock, M.D., Meriden, Conn., with George F. Lull, M.D., Chicago; Ernest B. Howard, M.D., Chicago, and Austin Smith, M.D., Chicago, as ex officio members. Thomas G. Hull, Ph.D., Chicago, is Director of the Scientific Exhibit.

Application blanks for space are now available and may be obtained from the Director, Scientific Exhibit, American Medical Association, 535 N. Dearborn St., Chicago 10.

MEDICAL LEGISLATION

FEDERAL

National Advisory Committee for the Blind

Four identical bills have been introduced proposing to establish a National Advisory Committee for the Blind to study existing federal, state, and local activities related to the granting of service to the blind. The committee would be charged with making a report with recommendations to the President and Congress prior to Jan. 3, 1953, for accomplishing coordination of effort, attainment of maximum benefits for the blind, and such other matters as the committee deems appropriate. The committee would be composed of nine members to be appointed by the President, with not more than five members from the same political party. The committee would appoint a staff without regard to civil service laws. The bills would authorize the committee to hold hearings and to secure information from any executive department, bureau, or other government agency. Power to subpoena witnesses is included. The sum of $50,000 is proposed to finance the project. The four bills are S. 1714, by Senator Lehman of New York, for himself and three other senators; H. R. 4079, by Representative Boggs of Delaware; H. R. 4212, by Representative Priest of Tennessee, and H. R. 4605, by Representative Elliott of Alabama.

Hospital for Juvenile Drug Addicts

Four identical bills have been introduced in the House of Representatives which propose to establish a hospital for juvenile drug addicts. These bills would authorize the Federal Security Administrator to use any funds available for the remodeling of the Ellis Island Marine Hospital in New York for the purpose of making that hospital available for the treatment, under the supervision of the Surgeon General of the Public Health Service, of juvenile drug addicts. After the reopening of the hospital, the Surgeon General is further authorized to admit for care and treatment any juvenile drug addict on his own application or that of his parents or on the recommendation of state or city correctional officers. A juvenile drug addict is defined as any person under 21 who is known to use, other than under the immediate supervision and direction of a licensed physician, any narcotic drug or derivative thereof. These four identical bills are H. R. 4549, introduced by Representative Clemente of New York; H. R. 4569, by Representative Dollinger of New York; H. R. 4577, by Representative Fine of New York, and H. R. 4579, by Representative Klein of New York.

Antivivisection

Representative Baring of Nevada introduced H. R. 4519, which proposes to protect live dogs and cats against torture, brutality, and useless painful experimentation within the District of Columbia. This bill provides for fine and imprisonment for any person who experiments or operates in the District of Columbia on living dogs or cats for any purpose other than the healing, curing, or sterilization of such animals.

Problems of the Aging

Six identical house resolutions have been introduced which would authorize a select committee on problems of the aging to be composed of seven members of the House of Representatives, all appointed by the Speaker. This Select Committee would be charged with investigating the status of the older age group with respect to its manpower potential and the basic problems in the fields of employment, health, education, and community services in connection with the utilization of this group and the federal government's responsibility in the problem. The committee would report to the House, as soon as practicable during the present Congress, the results of its studies and recommendations. The usual authority is given to the committee to require by subpoena or otherwise, the attendance and testimony of witnesses and the production of books, records, and other material.

These six resolutions are all identical with H. RES. 238, reported previously. They are H. RES. 265, introduced by Representative Bolling of Missouri; H. RES. 266, by Representative Case of New Jersey; H. RES. 267, by Representative Heselton of Massachusetts; H. RES. 269, by Representative Price of Illinois; H. RES. 276, by Representative McKinnon of California, and H. RES. 284, by Representative Elliott of Alabama.

STATE

Illinois

Bills Introduced.—H. 1256 and S. 785 propose the establishment of a narcotics hospital in the City of Chicago. H. 1257 and S. 784 propose the establishment of three out-patient clinics in the City of Chicago for the treatment of narcotic addicts.

Massachusetts

Bills Introduced.—H. 2577 proposes to amend the narcotic law by making it unlawful to sell, furnish or give away narcotic drugs to a minor. H. 2585, Appendix D, proposes to authorize a special commission making an investigation and study relative to high blood pressure to print and sell its report. H. 2585, Appendix E, proposes to extend the existence of the special committee investigating the problem of high blood pressure.

Michigan

Bill Introduced.—S. C. R. 62 proposes the creation of a special committee to study problems pertaining to narcotics to determine whether or not present state laws are adequate.

Missouri

Bill Enacted.—S. 137 was approved June 25, 1951. It amends the workmen's compensation law by, among other things, providing that if an employee desires, he shall have the right to select his own physician, surgeon or other such person at his own expense.

The summary of federal legislation was prepared by the Washington Office of the American Medical Association and the summary of state legislation by the Bureau of Legal Medicine and Legislation.

PROCEEDINGS OF THE ATLANTIC CITY SESSION

THE SCIENTIFIC EXHIBIT

The Scientific Exhibit at the Atlantic City Session was one of the largest in the history of the American Medical Association and, in general quality of material shown and in teaching value, was also one of the best. The location in the Lower Level of Convention Hall seemed to meet with the approval of visitors, allowing for wider aisles, less crowding, and a general atmosphere of serious study. The advantages of the arrangements outweighed certain disadvantages. There were 297 exhibits occupying 306 booths.

The several special features attracted large and attentive audiences. The Special Exhibit on Fractures, an annual affair since 1926, and as popular as ever, occupied six booths, where demonstrations were carried on simultaneously and continuously under the guidance of Kellogg Speed, M.D., Chicago, assisted by Frederick A. Jostes, M.D., St. Louis, and Gordon M. Morrison, M.D., Boston, and a large group of demonstrators.

The exhibit symposium on Overweight, Nutrition, and Health occupied five booths, with an adjacent conference room seating 125 persons. Enthusiastic audiences overcrowded the available facilities most of the week. The committee in charge consisted of James R. Wilson, M.D., chairman, Chicago; Herbert H. Marks, New York, and Arnold B. Kurlander, M.D., Washington, D. C.

The special exhibit on fresh pathology was presented with the cooperation of the several medical schools and various hospitals in Philadelphia as well as the Atlantic City Hospital. The Section on Urology cooperated with the Section on Pathology and Physiology in presenting specimens. William P. Belk, M.D., Ernest E. Aegerter, M.D., Jefferson H. Clark, M.D., and Peter A. Herbut, M.D., were assisted by a large group of demonstrators.

Diabetes demonstrations were carried on in two booths and in an adjoining conference room under the guidance of Howard F. Root, M.D., Boston. Facilities were crowded to capacity at all times.

SECTION EXHIBITS

Groups of exhibits were presented by the various sections of the Scientific Assembly with the cooperation of the section representatives. The section representatives, together with the section secretaries, were more than usually active in seeking out new exhibits and in advice and assistance to the Committee on Scientific Exhibit. The result was 436 applications for space, besides numerous inquiries which were discouraged because there was no possibility of accommodating additional exhibits.

Anesthesiology.—There were 10 exhibits, of which one received a certificate of merit and one an honorable mention. The section representative was Scott M. Smith, M.D., Salt Lake City.

Dermatology and Syphilology.—The section had 13 exhibits. One received a certificate of merit and one an honorable mention. Exhibits on ionizing radiations was one of the features of this section. James A. Webster, M.D., Chicago, was the section representative.

Diseases of the Chest.—There were 12 exhibits in this group, with four awards, consisting of a gold medal, a certificate of merit, and two honorable mentions. The section representative was Edwin R. Levine, M.D., Chicago.

Experimental Medicine and Therapeutics.—In this group there were 15 exhibits, of which four received awards. There was a silver medal, a bronze medal, a certificate of merit, and an honorable mention. Robert W. Wilkins, M.D., Boston, was the section representative.

Gastro-Enterology and Proctology.—There were 12 exhibits in the group, of which two received awards, consisting of a certificate of merit and an honorable mention. The section representative for Gastro-Enterology was Everett D. Kiefer, M.D., Boston, and for Proctology, J. P. Nesselrod, M.D., Evanston, Ill.

General Practice.—This section had 11 exhibits with two awards, consisting of a certificate of merit and an honorable mention. Charles E. McArthur, M.D., Olympia, Wash., was the section representative.

Internal Medicine.—There were 18 exhibits in the group, with five awards, consisting of a certificate of merit and four honorable mentions. The section representative was Wesley W. Spink, M.D., Minneapolis.

Laryngology, Otology and Rhinology.—The section had 20 exhibits, of which four received awards, consisting of a certificate of merit and three honorable mentions. Members of the section cooperated in the group of exhibits on Noise in Industry. The section representative was Francis W. Davison, M.D., Danville, Pa.

Nervous and Mental Diseases.—There were 17 exhibits in the group, with three awards, consisting of a certificate of merit and two honorable mentions. Leon J. Whitsell, M.D., San Francisco, was the section representative.

Obstetrics and Gynecology.—The section had 12 exhibits, of which three received awards, consisting of a gold medal, a certificate of merit, and an honorable mention. Frederick H. Falls, M.D., Chicago, was the section representative.

Ophthalmology.—This section had nine exhibits, with four awards, consisting of a certificate of merit and three honorable mentions. The section exhibit committee was composed of Georgiana D. Theobald, M.D., Oak Park, Ill., chairman; Donald J. Lyle, M.D., Cincinnati, and Phillips Thygeson, M.D., San Jose, Calif.

Orthopedic Surgery.—There were 15 exhibits in the group, of which three received awards, consisting of one certificate of merit and two honorable mentions. Robert J. Joplin, M.D., Boston, was the section representative.

Pathology and Physiology.—This section had 20 exhibits, of which four received awards, consisting of one certificate of merit and three honorable mentions. Members of the section cooperated in the Special Exhibit on Fresh Pathology. Frank W. Konzelmann, M.D., Washington, D. C., served as the section representative.

Pediatrics.—There were 22 exhibits in the section, of which four received awards, consisting of one gold medal, one certificate of merit, and two honorable mentions. The section representative was F. Thomas Mitchell, M.D., Memphis, Tenn.

Physical Medicine and Rehabilitation.—There were nine exhibits in this section, of which three received awards, including one certificate of merit and two honorable mentions. Arthur L. Watkins, M.D., Boston, served as representative to the section.

Preventive and Industrial Medicine and Public Health.—There were 13 exhibits in the section, of which four received awards, consisting of one certificate of merit and three honorable mentions. A special feature was the group of exhibits on Noise in Industry sponsored by the Council on Industrial Health and the Council on Physical Medicine and Rehabilitation of the American Medical Association, together with the Committee on Conservation of Hearing of the American Academy of Ophthalmology and Otolaryngology, and the Acoustical Society of America. Paul A. Davis, M.D., Akron, Ohio, was the section representative.

Radiology.—There were 15 exhibits in the section, of which four received awards, including one certificate of merit and three honorable mentions. Richard H. Chamberlain, M.D., Philadelphia, was the section representative.

Surgery, General and Abdominal.—There were 27 exhibits in this section, of which five received awards, consisting of one silver medal, one bronze medal, one certificate of merit, and two honorable mentions. Walter G. Maddock, M.D., Chicago, was the section representative.

Urology.—This section had nine exhibits, of which two received awards, consisting of one certificate of merit and one honorable mention. The section participated in the Special Exhibit on Fresh Pathology with urologic specimens each afternoon. Another feature was a daily discussion of all exhibits in the Urology Section. The section exhibit committee consisted of Roger W. Barnes, M.D., Los Angeles, chairman; Rubin H. Flocks, M.D., Iowa City, and George H. Ewell, M.D., Madison, Wis.

There were nine miscellaneous exhibits, of which two received awards, consisting of one certificate of merit and one honorable mention.

MOTION PICTURES

Motion pictures were shown in two rooms on the Main Floor adjacent to the Technical Exposition. Thirty-seven films were presented once each day during the week, with the authors of 11 of the films being present to discuss them. The films were selected after careful previewing by competent authorities from more than 100 applications. The program was carried on with the cooperation of the Committee on Medical Motion Pictures.

AWARDS

Medal awards were made to exhibits for original investigation and for teaching value. Certificates of Merit and Honorable Mention awards were presented to the best exhibits in each section. The members of the Committee on Awards worked long and faithfully and were assisted by section representatives and other specialists called in for advice and consultation.

REPORT OF COMMITTEE ON AWARDS

The Committee on Awards made the following report:

MEDAL AWARDS

Group I.—Awards in this group are made for exhibits of individual investigations, which are judged on the basis of originality and excellence of presentation. Duplicate Gold Medals are awarded in Group I.

The GOLD MEDAL to Robert P. Glover, Charles P. Bailey, and Thomas J. E. O'Neill, Hahnemann Medical College and Hospital, Episcopal Hospital, Philadelphia, for the exhibit on Intracardiac Surgery for Acquired and Congenital Heart Disease.

The GOLD MEDAL to Willis J. Potts, William L. Riker, and Robert DeBord, Children's Memorial Hospital, Chicago, for the exhibit on Surgery for Congenital Heart Disease.

The SILVER MEDAL to David Cayer and W. E. Cornatzer, Bowman Gray School of Medicine, Winston-Salem, N. C., for the exhibit on Role of Lipotropic Agents in Liver Disease—A Study of Phospholipide Synthesis Using Radiophosphorus.

The BRONZE MEDAL to William P. Boger, Walter V. Matteucci, Nelson H. Schimmel, and Harrison F. Flippin, Philadelphia General Hospital, Philadelphia, for the exhibit on Benemid—Its Influence on PAS, Penicillin, and Other Antibiotics.

Group II.—Awards in this group are made for exhibits which do not exemplify purely experimental studies but are judged on the basis of excellence of correlating facts and excellence of presentation.

The GOLD MEDAL to Walter W. Williams, Springfield Hospital, Springfield, Mass., and Irving F. Stein and Melvin R. Cohen, Michael Reese Hospital, Chicago, for the exhibit on Fertility and Sterility—Diagnostic and Prognostic Procedures.

The SILVER MEDAL to C. Stuart Welch and William Dameshek, Pratt Diagnostic Clinic, New England Center Hospital, Boston, for the exhibit on Surgery of the Spleen.

The BRONZE MEDAL to Robert R. Linton, Chester M. Jones, John J. Cranley Jr., James L. Buchanan, Daniel S. Ellis, and Arthur French, Brookline, Mass., for the exhibit on the Surgical Treatment of Bleeding Esophageal Varices (Portal Hypertension).

SECTION AWARDS

Certificates of Merit and Honorable Mention are awarded to the following in each Section.

Section on Anesthesiology.—Certificate of Merit to Lloyd D. Seager and Edwin L. Rushia, University of Arkansas School of Medicine, Little Rock, Ark., for the exhibit on Curare Antidotes—Anticurare Action of Some Neostigmine Derivatives.

Honorable Mention to John G. P. Cleland, University of Oregon Medical School and Oregon City Hospital, Oregon City, Ore., for the exhibit on Continuous Segmental Analgesia in Obstetrics and Surgery.

Section on Dermatology and Syphilology.—Certificate of Merit to Robert R. Kierland, P. A. O'Leary, L. A. Brunsting, and J. W. Didcoct, Mayo Clinic, Rochester, Minn., for the exhibit on Cortisone and ACTH—Their Use in Dermatology.

Honorable Mention to Eugene S. Bereston and Maurice Sullivan, Johns Hopkins Hospital, Baltimore, for the exhibit on Topical Therapy of *Tinea Capitis Due to M. Audouini.*

Section on Diseases of the Chest.—Certificate of Merit to Chevalier L. Jackson, John Franklin Huber, and Charles M. Norris, Temple University School of Medicine, Philadelphia, for the exhibit on the Segmental Bronchi and Bronchopulmonary Segments.

Honorable Mention to Hurley L. Motley, Burgess Gordon, Peter A. Theodos, and Joseph F. Tomashefski, The Barton Memorial Hospital, Philadelphia, for the exhibit on Studies of Pulmonary Function Impairment in Coal Miners.

Honorable Mention to Samuel H. Belgorod, New York, for the exhibit on Chemotherapy in Tuberculosis.

Section on Experimental Medicine and Therapeutics.—Certificate of Merit to J. L. Bollman, Mayo Clinic, Rochester, Minn., for the exhibit on Liver Lymph and Intestinal Lymph in Experimental Cirrhosis and Ascites.

Honorable Mention to Augustus Gibson, Charles E. Lyght, Stephen Fromer, and Lyon P. Strean, Merck & Company, Inc., Rahway, N. J., for the exhibit on Cortisone as an Investigative and Therapeutic Agent.

Section on Gastro-Enterology and Proctology.—Certificate of Merit to Asher Winkelstein, The Mount Sinai Hospital, New York, for the exhibit on Banthine for Peptic Ulcer—Clinical and Physiologic Studies.

Honorable Mention to Paul L. Shallenberger, Charles H. DeWan, Clayton B. Weed Jr., and John Reganis, Guthrie Clinic, Sayre, Pa., for the exhibit on Gastroscopic Biopsy.

Section on General Practice.—Certificate of Merit to Karl Haase, Veterans Administration Center, Los Angeles, and Bernard Daitz, Department of Medicine and Surgery, Veterans Administration, Washington, D. C., for the exhibit on Chronic Illness—A Growing Challenge.

Honorable Mention to Steven O. Schwartz and Sherman R. Kaplan, Hektoen Institute for Medical Research of the Cook County Hospital, Chicago, for the exhibit on Iron Deficiency Anemia—A Dynamic Concept.

Section on Internal Medicine.—Certificate of Merit to Charles P. Emerson Jr. and Franklin G. Ebaugh Jr., Boston University School of Medicine and Evans Memorial Hospital, Carl W. Walter, James L. Tullis, C. A. Janeway, L. K. Diamond, John G. Gibson II, Edward S. Buckley Jr., and Theodore Sack, Harvard Medical School, Peter Bent Brigham Hospital and Children's Hospital, Boston, for the exhibit on New Developments in Collection and Processing of Donor Blood.

Honorable Mention to Herbert C. Allen Jr., Raymond L. Libby, Benedict Cassen, and William E. Goodwin, Radioisotope Unit, Veterans Administration Center and University of California at Los Angeles School of Medicine, Los Angeles, for the exhibit on The Scintillation Counter—A New Diagnostic Instrument.

Honorable Mention to Arthur M. Master, Isaac Goldstein, and Max B. Walters, Mount Sinai Hospital, New York, for the exhibit on New Limits of Normal Blood Pressure—Clinical Application.

Honorable Mention to Ella Roberts, Marian Wikingsson, and C. Robert Wells, Philadelphia, for the exhibit on Ten Years' Experience with Sulfonamides in the Prophylaxis of Rheumatic Fever.

Honorable Mention to Kendall Emerson Jr., Stanley Kahn, John Vester, and Dexter Nelson, Peter Bent Brigham Hospital, Boston, for the exhibit on Cation Exchange Resins of the Carboxyl Type in the Treatment of Edema.

Section on Laryngology, Otology and Rhinology.—Certificate of Merit to Aram Glorig, Silver Spring, Md., for the exhibit on Dihydrostreptomycin and Streptomycin and the Inner Ear.

Honorable Mention to Lawrence Reynolds, K. E. Corrigan, H. S. Hayden, and F. R. Birkhill, Harper Hospital, Detroit, for the exhibit on Radioactive Isotope Tracers in Early Detection of Malignancy.

Honorable Mention to William C. Thornell, University of Cincinnati College of Medicine, Cincinnati, for the exhibit on A New Intralaryngeal Approach for Arytenoidectomy in Bilateral Abductor Vocal Cord Paralysis.

Honorable Mention to Irvin Hantman, Georgetown University School of Medicine and Episcopal Eye, Ear and Throat Hospital, Washington, D. C., for the exhibit on Diseases of the Ear Drum.

Section on Nervous and Mental Diseases.—Certificate of Merit to Ernest Spiegel, Henry T. Wycis, Herbert Freed, and H. Baird, Temple University School of Medicine and Hospital, Philadelphia, for the exhibit on The Stereoencephalotome and Its Application.

Honorable Mention to Ralph B. Cloward, Honolulu, Hawaii, for the exhibit on Treatment of Ruptured Lumbar Disks by Intervertebral Fusion, Surgical Techniques and Statistics.

Honorable Mention to George E. Moore, Douglas A. Kohl, Shelley N. Chou, and William T. Peyton, University of Minnesota Hospitals, Minneapolis, for the exhibit on Use of Fluorescein and Radioactive Isotopes in Localization of Brain Tumors.

Section on Obstetrics and Gynecology.—Certificate of Merit to H. E. Nieburgs and E. R. Pund, Medical College of Georgia, Augusta, Ga., for the exhibit on Etiologic and Diagnostic Factors in Cervical Cancer.

Honorable Mention to Mario A. Castallo, Amos S. Wainer, and John M. Stack, Jefferson Medical College and Hospital, Philadelphia, for the exhibit on Experimental Recanalization of Fallopian Tubes.

Section on Ophthalmology.—Certificate of Merit to D. M. Gordon, J. M. McLean, and H. Koteen, Cornell University Medical College, New York, for the exhibit on ACTH and Cortisone in Ophthalmology.

Honorable Mention to David D. Donaldson, Howe Laboratory, Boston, for the exhibit on Stereophotographs of Anatomical Preparations for Teaching Neuro-ophthalmology.

Honorable Mention to Arthur J. Bedell, Albany, N. Y., for the exhibit on The Macular Region in the Elderly.

Honorable Mention to Glen G. Gibson, Robert W. Mather and Robert H. Peckham, Temple University School of Medicine, Philadelphia, for the exhibit on Diagrammatic and Photographic Presentation of Retinal Arteriolar Changes in Hypertension.

Section on Orthopedic Surgery.—Certificate of Merit to G. W. Hyatt, T. C. Turner, and Andrew Bassett, United States Naval Medical School, Bethesda, Md., for the exhibit on New Methods of Preserving Skin, Bone, and Blood Vessels.

Honorable Mention to George G. Rowe and Maurice B. Roche, Washington University School of Medicine, St. Louis, for the exhibit on The Separate Neural Arch.

Honorable Mention to Frederick Lee Liebolt and Louise Beury Flynn, New York Hospital, Cornell Medical Center, New York, for the exhibit on Injuries to the Menisci of the Knee Joint.

Section on Pathology and Physiology.—Certificate of Merit to Karl Singer and Amoz I. Chernoff, Medical Research Institute, Michael Reese Hospital, Chicago, for the exhibit on Pathogenesis of Sickle Cell Anemia and Other Hereditary Hemolytic Syndromes.

Honorable Mention to Hans Elias and Hans Popper, Chicago Medical School and Hektoen Institute of Medical Research, Cook County Hospital, Chicago, for the exhibit on Functional Anatomy of the Normal and Cirrhotic Liver.

Honorable Mention to Shepard Shapiro, New York, for the exhibit on Oral Anticoagulant Therapy.

Honorable Mention to Albert E. Bothe and F. O. Zillessen, Jeanes Hospital, Philadelphia, and A. J. Dalton, National Cancer Institute, Bethesda, Md., for the exhibit on the Golgi Material and Mitochondria in Benign and Malignant Lesions.

Section on Pediatrics.—Certificate of Merit to Benjamin M. Gasul, Egbert H. Fell, Maurice Lev, William P. Mavrelis, Oldrich Prec, and Raul Casas, Hektoen Institute of Medical Research, Cook County Children's Hospital, Presbyterian Hospital, and the University of Illinois College of Medicine, Chicago, for the exhibit on Congenital Heart Disease in Pediatrics—A Study of Over 700 Cases.

Honorable Mention to Leon Unger, A. Alvin Wolf, Albert H. Unger, and Tybee Sue Meyers, Northwestern University Medical School, Chicago, for the exhibit on Bronchial Asthma in Children.

Honorable Mention to Jay M. Arena and Grant Taylor, Duke Hospital, Durham, N. C., for the exhibit on Accidental Poisoning in Children.

Section on Physical Medicine and Rehabilitation.—Certificate of Merit to F. A. Hellebrandt and Sara Jane Houtz, Medical College of Virginia, Richmond, Va., and National Society for Crippled Children and Adults, Inc., for the exhibit on Evaluating the Physical Disabilities of the Cerebral Palsied.

Honorable Mention to Archer S. Gordon, Max S. Sadove, Frank Raymon, and Andrew C. Ivy, University of Illinois College of Medicine, Chicago, for the exhibit on Artificial Respiration—Recent Advances in Manual Methods.

Honorable Mention to Julia F. Herrick, Frank H. Krusen, Gordon M. Martin, and Earl C. Elkins, Mayo Foundation, Rochester, Minn., for the exhibit on Effects of Ultrasonic Energy on Tissues.

Section on Preventive and Industrial Medicine and Public Health.—Certificate of Merit to Werner Henle and M. Michael Sigel, Children's Hospital of Philadelphia, and University of Pennsylvania School of Medicine, Philadelphia, for the exhibit on Virus Diagnostic Laboratory.

Honorable Mention to Thomas D. Dublin, National Health Council, New York, for the exhibit on Healthy Communities Don't Just Happen.

Honorable Mention to George N. Papanicolaou, J. E. Seybolt, W. A. Cooper, L. W. Hanlon, and Irene Koprowska, New York, for the exhibit on Cytology of Cancer.

Honorable Mention to Elmer H. Loughlin, Aurele A. Joseph, and Irving Rappaport with Hodelin René, Institute of Inter-American Affairs, Port-au-Prince, Haiti, on Yaws Control with Antibiotics.

Section on Radiology.—Certificate of Merit to Edwin C. Ernst, Barnard Free Skin and Cancer Hospital, St. Louis, for the exhibit on Recent New Developments in the Application of Radium in the Treatment of Carcinoma of the Cervix.

Honorable Mention to Roger A. Harvey, John S. Laughlin, and Lewis L. Haas, University of Illinois College of Medicine, Chicago, for the exhibit on Medical Application of the Betatron.

Honorable Mention to Wallace S. Tirman, Harry W. Banker, and Charles B. Caylor, Bluffton, Ind., for the exhibit on Microradiography.

Honorable Mention to Walter S. Lusby, John W. Coltman, Richard L. Longini, and Fitz-Hugh B. Marshall, Westinghouse Electric Corporation, Baltimore, for the exhibit on Fluoroscopic Image Amplification.

Section on Surgery, General and Abdominal.—Certificate of Merit to H. E. Bacon, L. E. McCrea, H. D. Trimpi, C. C. Jackson, and I. Sauer, *Temple University Hospital, Philadelphia,* for the exhibit on Extended Radical Resection for Cancer of the Rectum; Pelvic Viscerectomy with Cutaneous Ureterostomy.

Honorable Mention to Julian B. Herrmann, Montefiore Hospital, New York, for the exhibit on The Effect of Hormonal Imbalance on Advanced Mammary Carcinoma.

Honorable Mention to Richard B. Cattell and Kenneth W. Warren, The Lahey Clinic, Boston, for the exhibit on Surgical Diseases of the Pancreas.

Section on Urology.—Certificate of Merit to M. Leopold Brodny and Samuel A. Robins, Beth Israel Hospital, Tufts College Medical School, Boston, for the exhibit on Prostatography.

Honorable Mention to R. H. Flocks, R. G. Bunge, J. S. Greenleaf, W. N. Harness, J. M. Tudor, and L. J. Prendergast, University Hospital, Iowa City, for the exhibit on Carcinoma of the Prostate.

Section on Miscellaneous Topics.—Certificate of Merit to A. Reynolds Crane, 200th Anniversary Committee, Pennsylvania Hospital, Philadelphia, for the exhibit on Pennsylvania Hospital—200th Anniversary of the Nation's First Hospital.

Honorable Mention to Major General Harry G. Armstrong, USAF (MC) Surgeon General, Department of the Air Force, Washington, D. C., for the exhibit on The Emergency Medical Crash Services (Featuring the New Mobile Ward Crash Cart).

The Committee on Awards recommends that recognition be given to the following groups for their efforts in presenting valuable clinical demonstrations on (1) fractures, (2) overweight, nutrition, and health, (3) pathology, (4) diabetes, and (5) noise in industry: Exhibit Committee on Fractures, Dr. Kellogg Speed, Chicago, *Chairman;* Exhibit Committee on Overweight, Nutrition and Health, Dr. James R. Wilson, Chicago, Chairman; Exhibit Committee on Diabetes, Dr. Howard F. Root, Boston, Chairman; Exhibit Committee on Pathology Specimens, Dr. William P. Belk, Philadelphia, Chairman, and Council on Industrial Health and Council on Physical Medicine and Rehabilitation of the American Medical Association, Chicago, together with the Committee on Conservation of Hearing of the American Academy of Ophthalmology and Otolaryngology and the Acoustical Society of America.

The Committee on Awards was greatly impressed with the excellence of the motion picture program.

Respectfully submitted,

O. P. J. Falk, M.D., St. Louis, Mo., Chairman.
Keith S. Grimson, M.D., Durham, N. C.
Paul H. Holinger, M.D., Chicago.
Leonard A. Scheele, M.D., Washington, D. C.
W. Walter Wasson, M.D., Denver.

MINUTES OF THE SCIENTIFIC SECTIONS

SECTION ON ANESTHESIOLOGY

Wednesday, June 13—Morning

The meeting was called to order at 9 o'clock by the chairman, Dr. H. Boyd Stewart, Tulsa, Okla.

Drs. Robert D. Dripps and Leroy D. Vandam, Philadelphia, presented a paper on "The Hazards of Lumbar Puncture," which was discussed by Drs. Frank Cole, Lincoln, Neb., and Urban H. Eversole, Boston.

The following papers were read as a symposium on "Plasma Volume Expanders in the Treatment of Shock":

Dr. Jesse L. Bollman, Rochester, Minn.: "Volemic Substances for the Maintenance of Plasma Volume After Blood Loss."

Dr. Frank W. Hartman, Detroit: "Tissue Changes Following the Use of Plasma Substitutes."

Dr. Walter L. Bloom, Emory University, Ga.: "Present Status of Plasma Volume Expanders in the Treatment of Shock: Clinical Laboratory Studies."

Drs. Winchell McK. Craig, Howard K. Gray and John S. Lundy, Rochester, Minn.: "Present Status of Plasma Volume Expanders in the Treatment of Shock: Clinical Results in Surgery."

These four papers were discussed by Drs. I. S. Ravdin, Philadelphia; Edwin J. Pulaski, San Antonio, Texas; Donald E. Hale, Cleveland; Lloyd R. Newhouser, Washington, D. C.; Everett I. Evans, Richmond, Va.; Douglas B. Kendrick Jr., Washington, D. C.; Frederick M. Allen, New York, and John Scudder, New York.

Thursday, June 14—Morning

The following officers were elected: chairman, Dr. Stevens J. Martin, Hartford, Conn.; vice chairman, Dr. Mary M. Lyons, Ravinia, Ill., and representative to the Scientific Exhibit, Dr. Scott M. Smith, Salt Lake City. Drs. Stewart C. Cullen, Iowa City; Perry P. Volpitto, Augusta, Ga., and Stevens J. Martin, Hartford, Conn., were elected members of the American Board of Anesthesiology.

Dr. R. J. Whitacre, East Cleveland, Ohio, presented a report from the American Board of Anesthesiology.

Dr. Edward B. Tuohy, Washington, D. C., in the absence of the delegate, Dr. Ruth, gave a brief report of the activities being considered by the House of Delegates.

On motion of Dr. Moses H. Krakow, New York, seconded by Dr. Edward B. Tuohy, Washington, D. C., it was voted that the question of asking the American Medical Association to provide ballot forms for election of section officers be referred to the executive committee for decision and action.

Drs. F. Paul Ansbro, Francis S. Latteri and Benson Bodell, Brooklyn, presented a paper on "Continuous Lumbar Epidural Block: The Answer to Spinal Anesthesia Complications." This paper was discussed by Drs. Robert A. Hingson, Baltimore, and Edward B. Tuohy, Washington, D. C.

Dr. Carl S. Hellijas, Hartford, Conn., read a paper, "Preoperative and Postoperative Respiratory Studies," which was discussed by Drs. Irving M. Pallin and Barnett A. Greene, Brooklyn.

Dr. Roger W. Ridley, Rochester, Minn., read a paper, "Studies of the Minute Volume Respiration During Anesthesia," which was discussed by Dr. Edward T. Lawless, Bloomfield, N. J.

With the vice chairman, Dr. Stevens J. Martin, presiding, Dr. H. Boyd Stewart, Tulsa, Okla., read the chairman's address, "Professional Obligations."

Drs. A. S. Keats, G. L. D'Allessandro and Henry K. Beecher, Boston, presented a paper, "A Controlled Study of the Treatment of Pain by Intravenous Procaine." This was discussed by Drs. Leo V. Hand, Boston, Raphael W. Robertazzi, Brooklyn, Frederick M. Allen, New York, and James E. Eckenhoff, Philadelphia.

Drs. V. K. Stoelting and J. P. Graf, Indianapolis, presented a paper on "Intravenous Propyl-Methyl-Carbingl Allyl Barbituric Acid for Hypnosis During Nitrous Oxide Anesthesia." This paper was discussed by Drs. R. J. Whitacre, East Cleveland, Ohio, and James E. Eckenhoff, Philadelphia.

Resuming the chair, the chairman read a resolution proposed by Dr. Henry S. Ruth, Haverford, Pa., section delegate, suggesting that the executive committees of the scientific sections through the section secretaries, respectfully request the Board of Trustees to allocate additional funds to each section sufficient to pay the expenses, in full or in part, of the section delegates to the meetings of the American Medical Association House of Delegates. It was moved by Dr. R. J. Whitacre, East Cleveland, Ohio, that authority be delegated to the executive committee to amend the resolution to proper form for presentation to the House of Delegates. The motion was regularly seconded and carried.

It was regularly moved, seconded and carried that a vote of thanks be extended to Dr. Scott M. Smith, Salt Lake City, for his excellent work with the Scientific Exhibit.

The chairman announced that a certificate of merit had been presented to Drs. Lloyd D. Seager and Edwin L. Rushia, Little Rock, Ark., for their scientific exhibit, and that honorable mention had been given to Dr. John G. P. Cleland, Oregon City, Ore., for his exhibit.

The newly elected officers were introduced.

Friday, June 15—Morning

Joint Meeting with Section on Urology

The chairman of the Section on Urology, Dr. John Arthur Taylor, New York, read the chairman's address, "Prostatectomy in the Aged." The address was discussed by Drs. Moses H. Krakow, New York, Rubin Flocks, Iowa City, and Thomas D. Moore, Memphis, Tenn.

Drs. Stevens J. Martin and Thomas M. Feeney, Hartford, Conn., presented a paper, "Anesthesia in Pediatric Urology," which was discussed by Drs. Meredith F. Campbell, New York, and Margery Deming, Philadelphia.

Dr. Richard Chute, Boston, read a paper on "The Preoperative and Postoperative Management of Aged Patients Undergoing Urological Surgery with Particular Reference to Problems of Nutrition and Body Chemistry." This paper was discussed by Drs. C. Walter Metz, Denver; Elmer Belt, Los Angeles; Edward N. Cook, Rochester, Minn., and John Arthur Taylor, New York.

Drs. E. M. Papper and George F. Cahill, New York, presented a paper, "Anesthetic Problems in the Hormonal Disorders of the Adrenal Gland," which was discussed by Dr. Francis F. Foldes, Pittsburgh.

Dr. Elmer Hess, Erie, Pa., spoke briefly on the work of the American Medical Association.

Dr. Hugh J. Jewett, Baltimore, read a paper, "Infiltrating Carcinoma of the Bladder: Relation of Early Diagnosis to Five Year Survival Rate After Complete Extirpation." This paper was discussed by Drs. E. Joseph Delmonico, Syracuse, N. Y.; Edward N. Cook, Rochester, Minn., and Meyer M. Melicow, New York.

Drs. Lloyd H. Mousel and O. A. Nelson, Seattle, presented a paper, "Renal Tumors," which was discussed by Drs. Wyland F. Leadbetter, Boston; Henry S. Ruth, Haverford, Pa.; Richard Chute, Boston; Henry K. Sangree, Philadelphia, and Meyer M. Melicow, New York.

SECTION ON DERMATOLOGY AND SYPHILOLOGY

Wednesday, June 13—Afternoon

The meeting was called to order at 2:10 p. m. by the vice chairman, Dr. John Eric Dalton, Indianapolis.

Dr. Dalton gave a résumé of the career of the Chairman of the Section, Dr. Dudley C. Smith, who died shortly after his election in 1950.

Dr. James R. Webster, Chicago, read the report of the Committee on Scientific Exhibit and announced the awards for scientific exhibits.

In the absence of Dr. Clinton W. Lane, St. Louis, Dr. John G. Downing, Boston, was asked to serve as a member of the Executive Committee.

Dr. Anthony C. Cipollaro, New York, presented the report of the Nominating Committee.

Dr. John Eric Dalton, Indianapolis, read the chairman's address, "History, Problems and Costs of the Industrial Health Movement with Special Reference to the Dermatoses."

Drs. Robert R. Kierland, Paul A. O'Leary, Louis A. Brunsting and John W. Didcoct, Rochester, Minn., presented a paper on "The Use of Cortisone and ACTH in Dermatology."

Drs. Thomas H. Sternberg and Victor D. Newcomer, Los Angeles, presented a paper on "Treatment of Atopic Dermatitis with Cortisone."

These two papers were discussed by Drs. Ray O. Noojin, Birmingham, Ala.; Boynton H. Booth, Indianapolis; E. E. Barksdale, Washington, D. C.; Maurice J. Costello, New York; James R. Webster, Chicago; Robert R. Kierland, Rochester, Minn., and Thomas H. Sternberg, Los Angeles.

Dr. John G. Downing, Boston, presented a paper on "Cancer of the Skin and Occupational Trauma," which was discussed by Drs. George T. Pack, New York, and Frederick M. Allen, New York.

Dr. Walter C. Lobitz Jr., Hanover, N. H., presented a paper on "Pustular Syringitis: A Sweat Retention Phenomenon Complicating Common Dermatoses." This paper was discussed by Dr. Marion B. Sulzberger, New York.

Dr. William B. Guy, Pittsburgh, presented a paper on "Neurogenic Factors in Contact Dermatitis," which was discussed by Dr. Francis W. Lynch, St. Paul.

Thursday, June 14—Afternoon

The following officers were elected: chairman, Dr. Francis W. Lynch, St. Paul; vice chairman, Dr. E. Myles Standish, Hartford, Conn.; secretary, Dr. John H. Lamb, Oklahoma City; delegate, Dr. Everett C. Fox, Dallas, Texas; alternate, Dr. Leonard F. Weber, Chicago.

Dr. George M. Lewis, New York, presented a report on the American Board of Dermatology.

Dr. Herbert Rattner, Chicago, presented a report on the *Archives of Dermatology and Syphilology*.

Dr. Anthony C. Cipollaro, New York, brought up the matter of education in dermatology at the undergraduate level, which was discussed by Drs. Donald Pillsbury, Philadelphia; Harold N. Cole, Cleveland; Herbert Rattner, Chicago, and Clarence S. Livingood, Galveston, Texas.

On motion regularly made, seconded and carried, it was voted that the chairman of the section appoint a committee to bring in a resolution on the educational matter. Dr. Dalton appointed the following committee: Drs. George M. Lewis, New York; Harold N. Cole, Cleveland; Nelson P. Anderson, Los Angeles, and Anthony C. Cipollaro, New York.

Dr. Harold N. Cole, Cleveland, presented the Guest Lecture, entitled "Erasmus and His Diseases."

Drs. John G. Thomsen and John E. Rauschkolb, Cleveland, presented a paper on "Contact X-ray Therapy of the Common Wart." This paper was discussed by Drs. Frank J. Eichenlaub, Washington, D. C., and John E. Rauschkolb, Cleveland, Ohio.

Drs. Maurice Sullivan and Eugene Bereston, Baltimore, presented a paper on "A Study of Topical Therapy in Tinea Capitis." This paper was discussed by Drs. J. Lamar Callaway, Durham, N. C.; Jacob H. Swartz, Boston; J. Walter Wilson, Los Angeles; George M. Lewis, New York; Albert M. Kligman, Philadelphia; Conrad Stritzler, Jamaica, N. Y., and Eugene Bereston, Baltimore.

Drs. Roy L. Kile, Evelyn Rockwell and Jan Schwarz, Cincinnati, presented a paper on "The Use of Neomycin in Dermatology."

Drs. Clarence S. Livingood, Samchai, Nilasena, J. Fred Mullins and Rufus A. Stevenson, Galveston, Texas, presented a paper on "Pyogenic Infections Treated by Neomycin."

These two papers were discussed by Drs. J. Lowry Miller, New York; Roy L. Kile, Cincinnati; Maurice J. Costello, New York, and Clarence S. Livingood, Galveston, Texas.

Drs. Leslie Paxton Barker and Harry Van Velsor, New York, presented a paper on "Penicillin Treatment of Latent Syphilis: A Study of 110 Cases Previously Treated with Chemotherapy." This paper was discussed by Dr. Herman Beerman, Philadelphia, and Dr. Leslie P. Barker, New York.

Friday, June 15—Afternoon

The delegate to the House of Delegates, Dr. Everett C. Fox, Dallas, Texas, made a report on the activities of the House of Delegates.

Dr. Harold N. Cole read the resolution brought in by a special committee appointed on Thursday, and on motion regularly made, seconded and carried, the resolution was unanimously adopted, as follows:

> Whereas, The American Medical Association is interested in well-trained general practitioners of medicine; and
>
> Whereas, Dermatology and syphilology constitute a large segment of the practice of medicine as a whole; and
>
> Whereas, Eight per cent of all admissions to military hospitals during World War II were dermatological patients; and

WHEREAS, Twelve to fifteen per cent of all questions in Queries and Minor Notes in The Journal of the American Medical Association pertain to dermatology and syphilology; and

WHEREAS, It has come to the attention of this section that there is a wide disparity in regard to the allotment of time devoted to the teaching of dermatology and syphilology, verging almost to complete neglect in some medical colleges; therefore be it

Resolved, That the Section on Dermatology and Syphilology of the American Medical Association deplores the deficient teaching programs of dermatology and syphilology of some medical schools; and be it further

Resolved, That this resolution be brought to the attention of the Board of Trustees of the American Medical Association, of the Council on Medical Education and Hospitals and of the Special Committee on Medical Education.

Dr. Frances Pascher, Brooklyn, presented a paper on "Sternal Marrow Findings in Selected Dermatoses," which was discussed by Drs. Edward P. Cawley, Charlottesville, Va., and Dr. Pascher.

Drs. J. B. Howell, Dallas, Texas, J. Walter Wilson, Los Angeles, and Marcus R. Caro, Chicago, presented a paper on "Tinea Capitis Caused by Trichophyton Tonsurans (Sulfureum or Crateriforme)." This paper was discussed by Drs. Royal M. Montgomery, New York; Everett R. Seale, Houston, Texas, and Walter Wilson, Los Angeles.

Drs. Jeff Davis and George T. Pack, New York, presented a paper on "Erythema Multiforme Following Deep X-Ray Therapy," which was discussed by Drs. Robert N. Buchanan Jr., Nashville, Tenn., and Jeff Davis, New York.

Dr. Isadore I. Fisher, Minneapolis, presented a paper on "Pemphigus Vulgaris: A Clinical and Laboratory Study." This paper was discussed by Drs. Maurice J. Costello, New York, and Isadore I. Fisher, Minneapolis.

Dr. Harold G. Ravitz, St. Paul, presented a paper on "Treatment of Superficial Dermatomycoses with Asterol Dihydrochloride." This paper was discussed by Drs. Jacob H. Swartz, Boston; Bernard Appel, Lynn, Mass.; Robert N. Buchanan Jr., Nashville, Tenn.; Edmond K. Edelson, Newark, N. J.; Everett R. Seale, Houston, Texas, and Harold G. Ravitz, St. Paul.

Dr. Coleman Mopper, Hamtramck, Mich., presented a paper on "Primary Fibrosarcoma of the Skin," which was discussed by Drs. G. W. Binkley, Cleveland; Jeff Davis, New York, and Dr. Mopper.

SECTION ON DISEASES OF THE CHEST

WEDNESDAY, JUNE 13—AFTERNOON

The meeting was called to order by the chairman, Dr. Alvis E. Greer, Houston, Texas.

Dr. Alvis E. Greer presented the chairman's address: "The Evolution of Medicine."

Drs. Hyman E. Bass, David Greenberg, Milton A. Miller and Emanuel Singer, New York, presented a paper on "Pulmonary Changes in Uremia." This paper was discussed by Dr. Esmond R. Long, Philadelphia, and Dr. Hyman E. Bass, New York.

Drs. J. W. Nixon and J. F. Perry, San Antonio, presented a paper on "Modern Trends in the Diagnosis and Treatment of Pulmonary Disease," which was discussed by Dr. Moses J. Stone, Boston, and Dr. Nixon.

Drs. Milton W. Anderson, John R. Kelsey Jr., and Jesse E. Edwards, Rochester, Minn., presented a paper on "Clinical and Pathological Considerations in Patients with Calcific Aortic Stenosis." This paper was discussed by Dr. John F. Briggs, St. Paul, and Dr. Milton W. Anderson, Rochester, Minn.

Dr. O. A. Sander, Milwaukee, read a paper on "Chronic Berylliosis."

Drs. Ralph Horton, Oneonta, N. Y.; Evelyn F. H. Rogers, Utica, N. Y., and Robert F. Korns, Albany, N. Y., presented a paper on "Epidemic of Tuberculosis in a High School." This paper was discussed by Dr. F. M. Pottenger, Monrovia, Calif.

Drs. Herbert C. Sweet and Paul Murphy, St. Louis, presented a paper on "The Evaluation of Therapy in Pulmonary Emphysema," which was discussed by Dr. Leon H. Hirsch, Milwaukee.

Drs. Michael E. DeBakey, Houston, Texas, and Alton Ochsner, Paul T. DeCamp and C. J. Ray, New Orleans, presented a paper on "Bronchogenic Carcinoma with Particular Emphasis on Its Incidence and Early Manifestations." This paper was discussed by Dr. John F. Briggs, St. Paul, and Dr. Michael E. DeBakey, Houston, Texas.

THURSDAY, JUNE 14—AFTERNOON

The following officers were elected: chairman, Dr. J. Winthrop Peabody, Washington, D. C.; vice chairman, Dr. Joseph C. Placak, Cleveland; delegate, Dr. Hollis E. Johnson, Nashville, Tenn.; alternate, Dr. Edward Hayes, Monrovia, Calif. The secretary, Dr. Jay A. Myers, Minneapolis, continues for another year.

Drs. Burgess Gordon, Hurley L. Motley and Peter A. Theodos, Philadelphia, presented a paper on "The Use of Intermittent Positive Pressure Breathing and Streptomycin in the Management of Chronic Pulmonary Tuberculosis Complicating Silicosis." This paper was discussed by Dr. Edwin R. Levine, Chicago, and Dr. Burgess Gordon, Philadelphia.

Dr. Robert J. Anderson, Washington, D. C., read a paper on "Community-Wide X-Ray Surveys in Big Cities," which was discussed by Drs. Otto L. Bettag, Chicago; Frank J. Hill, Minneapolis, and Robert J. Anderson, Washington, D. C.

Dr. Herman J. Moersch, Rochester, Minn., read a paper on "The Significance of Hemoptysis," which was discussed by Drs. Porter P. Vinson, Richmond, Va., and Henry Scheer, New York.

Dr. Andrew L. Banyai, Milwaukee, read a paper on "The Management of Cough in Daily Practice."

Drs. Abraham Falk, and W. T. Tucker, Minneapolis, read a paper on "Clinical Implications of Idiopathic Pleural Effusions." This paper was discussed by Drs. Lee Ogden, New York, and W. T. Tucker, Minneapolis.

Dr. Daniel J. Glomset, Des Moines, Iowa, read a paper on "Cardiac Conduction," which was discussed by Dr. A. E. Jaffin, Jersey City, N. J., and Dr. Glomset.

FRIDAY, JUNE 15—AFTERNOON

Dr. William S. Schwartz, Oteen, N. C., read a paper on "Recent Drug Therapy in Diseases of the Chest," which was discussed by Drs. Harold L. Israel, Philadelphia, and William S. Schwartz, Oteen, N. C.

Dr. John F. Briggs, St. Paul, read a paper on "The Diagnosis and Treatment of Coronary Heart Disease." This paper was discussed by Drs. Harry Golston, Hartford, Conn.; Benjamin Miller, Baltimore, and John F. Briggs, St. Paul.

Dr. Philip Thorek, Chicago, read a paper on "Modern Diagnosis and Treatment of Esophageal Diseases," which was discussed by Drs. John F. Briggs, St. Paul, and Philip Thorek, Chicago.

Dr. Hobart A. Reimann, Philadelphia, read a paper on "The Differential Diagnosis of the Pneumonias."

SECTION ON EXPERIMENTAL MEDICINE AND THERAPEUTICS

WEDNESDAY, JUNE 13—AFTERNOON

The meeting was called to order at 2:05 p. m. by the chairman, Dr. James A. Greene, Houston, Texas.

The following papers were read as a symposium on "Liver Disease."

Drs. Joseph Stokes Jr., Miles E. Drake and John Farquhar, Philadelphia, and Mercer C. Blanchard, Columbus, Ga.: "Further Studies on the Epidemiology of Viral Hepatitis." This paper was discussed by Drs. W. P. Havens, Philadelphia, and Richard B. Capps, Chicago.

Drs. Victor M. Sborov and Theodore C. Keller, Washington, D. C.: "The Diagnosis of Hepatitis." This paper was discussed by Drs. Hans L. Popper and Richard B. Capps, Chicago.

Dr. John R. Neefe, Philadelphia: "Current Concepts of Treatment of Hepatitis." This paper was discussed by Drs. Franklin M. Hanger, New York, and F. J. Ingelfinger, Boston.

Dr. Henry G. Kunkel, New York: "The Fate of the Patient with Hepatitis." This paper was discussed by Dr. Joseph Post, New York.

Drs. J. T. Sessions Jr., Boston; J. C. Bullard, Framingham, Mass., and F. J. Ingelfinger, Boston: "The Effect of Barbiturates in Patients with Liver Disease." This paper was discussed by Drs. Jesse L. Bollman, Rochester, Minn.; E. M. Papper, New York, and James A. Greene, Houston, Texas.

Drs. Theodore B. Van Itallie and Frederick J. Stare, Boston: "The Clinical Use of Fat Injected Intravenously." This paper was discussed by Drs. Robert Elman, St. Louis; Jonathan E. Rhoads, Philadelphia, and Laurance W. Kinsell, Oakland, Calif.

Thursday, June 14—Afternoon

The following officers were elected: chairman, Dr. Carl V. Moore, St. Louis; vice chairman, Dr. Maurice H. Seevers, Ann Arbor, Mich.; secretary, Dr. Hugh R. Butt, Rochester, Minn.; delegate, Dr. Edgar V. Allen, Rochester, Minn.; alternate, Dr. Charles M. Gruber, Philadelphia; representative to the Scientific Exhibit, Dr. Robert W. Wilkins, Boston.

Dr. James A. Greene, Houston, Texas, presented the chairman's address on "Pituitary Dwarfism, a Therapeutic Dilemma."

Dr. William B. Castle, Boston, presented the Minot Lecture: "The Contributions of George Richards Minot to Experimental Medicine."

Drs. Ernest Yount, Marvin Rosenblum, and Robert L. McMillan, Winston-Salem, N. C., presented a paper on "Therapeutic Use of Quinidine: The Value of Blood Levels in Treatment." This paper was discussed by Drs. J. Edwin Wood Jr., Charlottesville, Va., and Harold Feil, Cleveland.

Dr. Marsh H. McCall, Samuel Musallam and Guillermo Porras, New York, prsented a paper on "Anticoagulant Therapy in Acute Myocardial Infarction," which was discussed by Drs. Nelson W. Barker, Rochester, Minn.; George C. Griffith, Pasadena, Calif.; Samuel Baer, Philadelphia, and E. S. Nichol, Miami.

Drs. Nelson W. Barker, Hugh H. Hanson, and Frank D. Mann, Rochester, Minn., presented a paper on "Comparative Effects of the Anticoagulants Dicumarol, Tromexan and 4-Hydroxy-Coumarin Anticoagulant 63." This paper was discussed by Drs. Shepard Shapiro, New York, and Charles Brambel, Baltimore.

Drs. Harrison F. Flippin and William P. Boger Jr., Philadelphia, presented a paper on "Present Day Treatment of Pneumonia," which was discussed by Dr. John Staige Davis, New York.

Friday, June 15—Morning

A joint meeting was held with the Section on Internal Medicine. The proceedings are reported in the minutes of that section.

SECTION ON GASTRO-ENTEROLOGY AND PROCTOLOGY

Wednesday, June 13—Afternoon

The meeting was called to order at 2 o'clock by the chairman, Dr. Frank G. Runyeon, Reading, Pa.

Dr. Benjamin M. Bernstein, Brooklyn, read a paper entitled "Acidity: Is It Related to Ulcer Syndrome?" This paper was discussed by Dr. Hyman I. Goldstein, Camden, N. J.

A paper entitled "Banthine: Clinical Evaluation in Gastro-Enterology," by Dr. Gordon McHardy, New Orleans, was presented and was discussed by Dr. Asher Winkelstein, New York; Dr. Cecil O. Patterson, Dallas, Texas; Dr. William P. Chapman, Boston; Dr. Henry A. Rafsky, New York; Dr. Erwin Levin, Chicago; Dr. Keith S. Grimson, Durham, N. C.; Dr. Benjamin M. Bernstein, New York, and Dr. Gordon McHardy, New Orleans.

Dr. Moses Paulson, Baltimore, read a paper entitled "Syndrome Following Total Gastrectomy," which was discussed by Dr. Dwight L. Wilbur, San Francisco; Dr. Thomas E. Machella, Philadelphia, and Dr. Moses Paulson, Baltimore.

Dr. Clifford J. Barborka, Chicago, presented a paper on the "Present Status of the Obesity Problem." This paper was discussed by Dr. James S. McLester, Birmingham, Ala.; Dr. Bruce Kenamore, St. Louis, and Dr. Clifford J. Barborka, Chicago.

A paper entitled "Gastric Polyps" was presented by Drs. Harry Yarnis and Richard H. Marshak, New York, and Dr. A. I. Friedman, Hackensack, N. J., and was discussed by Dr. James B. Carey, Minneapolis; Dr. Saul A. Schwartz, New York, and Dr. A. I. Friedman, Hackensack, N. J.

Drs. Max Ritvo, Norman Zamcheck, Melvin P. Osborne, Franklin W. White,* and Thomas C. Chalmers, Boston, and Max G. Carter, New Haven, Conn., presented a paper entitled "Early Diagnosis in Massive Upper Gastrointestinal Hemorrhage." This paper was discussed by Dr. A. H. Aaron, Buffalo; Dr. Fred E. Templeton, Seattle; Dr. Hyman I. Goldstein, Camden, N. J.; Dr. John T. Howard, Baltimore, and Dr. Norman Zamcheck, Boston.

Thursday, June 14—Afternoon

The following officers were elected: chairman, Dr. Grant H. Laing, Chicago; vice chairman, Dr. Louis E. Moon, Omaha; secretary, Dr. Donovan C. Browne, New Orleans; chairman, section committee on scientific exhibits, Dr. Everett D. Kiefer, Boston, and co-chairman, Dr. J. P. Nesselrod, Evanston, Ill.; representative to American Board of Proctology, Dr. Robert A. Scarborough, San Francisco.

Dr. A. H. Aaron, Buffalo, representative to the American Board of Gastro-Enterology, made his report, and Dr. Robert A. Scarborough, representative to the American Board of Proctology, gave a report.

A paper entitled "Adenomas of the Colon and Rectum" by Drs. George E. Binkley and Douglas A. Sunderland, New York, was presented, and was discussed by Drs. Harry E. Bacon, Philadelphia, and Robert A. Scarborough, San Francisco.

Drs. Sidney A. Portis and Joseph C. King, Chicago, presented a paper entitled "The Gastrointestinal Tract in the Aging." This paper was discussed by Drs. Martin S. Kleckner, Allentown, Pa.; Henry A. Rafsky, New York; Anthony Bassler, New York, and Sidney A. Portis, Chicago.

Dr. Frank G. Runyeon, Reading, Pa., read the chairman's address, entitled "Sigmoidoscopy: Its Clinical Importance to the Practitioner."

A paper entitled "ACTH in the Treatment of Ulcerative Colitis" was presented by Drs. Seymour J. Gray, Robert W. Reifenstein, J. C. Gordon Young, John A. Benson Jr., and Kenneth Sterling, Boston, and was discussed by Drs. J. Arnold Bargen, Rochester, Minn., and Franz J. Ingelfinger, Everett D. Kiefer and Seymour J. Gray, Boston.

A paper entitled "Multiple Polyposis: Results of Fulguration of Polyps in the Distal Portion of the Colon After Ileosigmoidostomy and Colectomy," was presented by Drs. Newton D. Smith and John R. Hill, Rochester, Minn. This paper was discussed by Dr. Garnet W. Ault, Washington, D. C.; Dr. Stuart T. Ross, Hempstead, N. Y., and Dr. Newton D. Smith, Rochester, Minn.

Drs. Maurice Feldman and Tobias Weinberg, Baltimore, presented a paper entitled "Aberrant Pancreas, a Cause of Duodenal Syndrome," which was discussed by Dr. Russell S. Boles, Philadelphia; Dr. Sara M. Jordan, Boston, and Dr. Maurice Feldman, Baltimore.

Friday, June 15—Morning

A joint meeting was held with the Section on Pathology and Physiology. The proceedings are reported in the minutes of that section.

SECTION ON GENERAL PRACTICE

Wednesday, June 13—Morning

The meeting was called to order at 9 o'clock by the chairman, Dr. Lester D. Bibler, Indianapolis.

Dr. Lester D. Bibler, Indianapolis, presented the "Chairman's Address."

Dr. David I. Macht, Baltimore, read a paper on "Influence of Some Medicinal and Emotional Factors on Blood Coagulation," which was discussed by Drs. Geza de Takats, Chicago, and David I. Macht, Baltimore.

Dr. Claude S. Beck, Cleveland, read a paper on "Operation for Coronary Artery Disease," which was discussed by Drs. George D. Geckeler, Philadelphia; N. A. Antonius, Newark, N. J.; Charles P. Bailey, Philadelphia; Harold Feil, Cleveland; Egmont J. Orbach, New Britain, Conn., and Claude S. Beck, Cleveland.

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* Deceased.

Dr. Russell S. Boles, Philadelphia, read a paper on "The Responsibility of the Physician to His Patient," which was discussed by Dr. Thomas E. Robinson, Salt Lake City.

Dr. Thomas E. Rardin, Columbus, Ohio, read a paper on "Psychosomatic Highlights."

Dr. William A. Schonfeld, New York, read a paper on "The General Practitioner's Role in the Management of Personality Problems of the Adolescent." This paper was discussed by Drs. Camille K. Cayley, New York; Herbert F. Robb, Belleville, Mich., and William A. Schonfeld, New York.

THURSDAY, JUNE 14—MORNING

The following officers were elected: chairman, Dr. Thomas E. Robinson, Salt Lake City; vice chairman, Dr. Richard A. Mills, Fort Lauderdale, Fla.; secretary, Dr. Eugene Baumgartner, Oakland, Md.; chairman, scientific exhibit, Dr. Charles E. McArthur, Olympia, Wash.

On motion of Dr. Thomas E. Robinson, Salt Lake City, seconded by Dr. Milton B. Casebolt, Kansas City, Mo., the following resolution was passed:

A RESOLUTION TO THE BOARD OF TRUSTEES FROM THE SECTION ON GENERAL PRACTICE

WHEREAS, The Board of Trustees in its respected and judicious decision created a Section on General Practice; and

WHEREAS, This section fills a long needed place for the free exchange of information among all men in all branches of medicine; and

WHEREAS, A large proportion of the industrial and accidental work is done by the general practitioner; now therefore be it

Resolved, That we as a section petition and ask that the Board of Trustees of the American Medical Association place a member of the Section on General Practice on the Council on Industrial Health.

Dr. William B. Norment, Greensboro, N. C., read a paper on "Diagnosis and Treatment of Pathology of the Uterine Canal with the Lens Hysteroscope."

Dr. Edward A. Schumann, Philadelphia, read a paper on "Obstetric Hemorrhage," which was discussed by Drs. Daniel H. Hiebert, Provincetown, Mass.; Ellis M. Markell, Harrison, N. Y., and Edward A. Schumann, Philadelphia.

Dr. Daniel B. Dorman, Pittsfield, Mass., read a paper on "The Management of the Abnormal Presentation During the Second Stage of Labor," which was discussed by Drs. J. Edward Lynch and Milton L. McCall, Philadelphia, and Daniel B. Dorman, Pittsfield, Mass.

Drs. F. Bayard Carter, Violet H. Turner, Clarence C. Davis and Edwin C. Hamblen, Durham, N. C., presented a paper on "Comparison of Previous Operations and Initial Pathology in Five Hundred Childless Couples." This paper was discussed by Drs. M. Edward Davis, Chicago; Fred A. Simmons, Boston, and Clarence C. Davis, Durham, N. C.

Dr. U. R. Bryner, Salt Lake City, read a paper on "An Evaluation of Socialized Medicine in Great Britain as Seen by a Member of the American Medical Association Committee." This was discussed by Drs. Morgan D. Person, Allentown, Pa., and U. R. Bryner, Salt Lake City.

FRIDAY, JUNE 15—MORNING

Dr. Robert Turell, New York, read a paper on "Proctology and the General Practitioner," which was discussed by Drs. A. A. Gladstone, Burlington, Vt.; F. H. Redewill, San Francisco; Richard I. Barstow, Norfolk, Conn., and Robert Turell, New York.

Dr. Milton B. Casebolt, Kansas City, Mo., read a paper on "Geriatrics: A Challenge to the General Practitioner."

Dr. F. H. Redewill, San Francisco, read a paper on "Biological Warfare."

Dr. W. J. Merle Scott, Rochester, N. Y., read a paper on "Clinical Results of Treatment by Aero-Pulse Principle in Postphlebitis and Varicose Venous Stasis." This paper was discussed by Drs. William F. Clark, Rochester, N. Y.; Thomas E. Robinson, Salt Lake City; Leo M. Boden, East Aurora, N. Y.; R. M. Cunningham, Baltimore, Md., and W. J. Merle Scott, Rochester, N. Y.

Dr. Burech Rachlis, Philadelphia, read a paper on "Vertigo," which was discussed by Drs. Matthew S. Ersner, Michael Scott and Burech Rachlis, Philadelphia.

Dr. Benjamin F. Byrd, Nashville, Tenn., read a paper on "The Fatal Pause in Diagnosis of Neoplastic Disease in the Physician Patient." This paper was discussed by Drs. James C. Kimbrough, Washington, D. C.; Richard M. Taliafero, Greensboro, N. C., and Benjamin F. Byrd, Nashville, Tenn.

SECTION ON INTERNAL MEDICINE

WEDNESDAY, JUNE 13—MORNING

The meeting was called to order at 9 o'clock by the chairman, Dr. Walter L. Palmer, Chicago.

Drs. Charles C. Wolferth, William A. Jeffers, Francis D. W. Lukens, Harold A. Zintel and Joseph H. Hafkenschiel, Philadelphia, presented a paper on "Subtotal Adrenalectomy in the Treatment of Arterial Hypertension." This paper was discussed by Drs. D. M. Green, Chicago, and Reginald H. Smithwick, Boston.

Drs. Thomas P. Lyon, John W. Gofman, Frank Lindgren and Hardin Jones, Berkeley, Calif., presented a paper on "Further Studies of the Relationship of Lipoproteins to Atherosclerosis." This paper was discussed by Drs. Louis N. Katz, Chicago, and W. C. Hueper, Bethesda, Md.

Dr. N. C. Gilbert, Chicago, delivered the Billings Lecture: "A History of the Treatment of Coronary Heart Disease."

Dr. Robert L. Levy, New York, presented a paper on "Needless Restrictions Imposed on Cardiac Patients," which was discussed by Drs. Henry A. Christian, Brookline, Mass.; John J. Sampson, San Francisco, and Hyman I. Goldstein, Camden, N. J.

Drs. Arthur M. Master and Harry L. Jaffe, New York, presented a paper on "Complete Functional Recovery from Acute Coronary Occlusion and Insufficiency." This paper was discussed by Drs. George C. Griffith, Pasadena, Calif.; A. Carlton Ernstene, Cleveland, and Hyman I. Goldstein, Camden, N. J.

Drs. J. Edwin Wood Jr., Donald H. Ferguson and Preston B. Lowrance, Charlottesville, Va., presented a paper on "Cation Exchange Resins as an Adjunct in the Treatment of Heart Failure." This paper was discussed by Drs. Edward S. Orgain, Durham, N. C., and J. Russell Elkinton, Philadelphia.

Dr. Fay A. LeFevre, Cleveland, presented a paper on "The Management of Occlusive Arterial Disease of the Extremities," which was discussed by Drs. Robert W. Wilkins, Boston; Milton Mendlowitz, New York; William S. Collens, Brooklyn, and Benjamin Jablons, New York.

THURSDAY, JUNE 14—MORNING

The following officers were elected: chairman, Dr. Carter Smith, Atlanta, Ga.; vice chairman, Dr. Truman G. Schnabel, Philadelphia; secretary, Dr. Herrman L. Blumgart, Boston; delegate, Dr. Charles T. Stone, Galveston, Texas; alternate, Dr. William D. Stroud, Philadelphia.

Drs. Paul S. Rhoads, Carl E. Billings and Vincent J. O'Conor, Chicago, presented a paper on "Problems in the Management of Urinary Tract Infections," which was discussed by Drs. Ernest E. Irons, Chicago, and Edward N. Cook, Rochester, Minn.

Dr. Emanuel Schwartz, Brooklyn, presented a paper on "Oral Cortisone in Intractable Bronchial Asthma," which was discussed by Drs. Carl E. Arbesman, Buffalo, and Theron G. Randolph and Walter L. Palmer, Chicago.

Dr. Walter L. Palmer, Chicago, Ill., presented the chairman's address on "Medical and Social Aspects of Problems of Population."

Drs. Lawrence E. Hinkle Jr., and Stewart G. Wolf Jr., New York, presented a paper on "The Importance of Life Stress in the Course and Management of Diabetes Mellitus." This paper was discussed by Drs. Edward Tolstoi, New York, and Garfield G. Duncan, Philadelphia.

Dr. Marc J. Musser, Madison, Wis., presented a paper on "Some Factors in the Early Diagnosis of Emotionally Conditioned Illness," which was discussed by Drs. Grete L. Bibring, Boston; Edward Weiss, Philadelphia, and Eugene Ziskind, Los Angeles.

FRIDAY, JUNE 15—MORNING

Joint Meeting with Section on Experimental Medicine and Therapeutics

The joint meeting was called to order at 9 o'clock by the chairman of the Section on Experimental Medicine and Therapeutics, Dr. James A. Greene, Houston, Texas.

All of the papers read at this joint meeting were presented as a "Symposium on Arteriosclerosis and Hypertension."

Dr. Herbert Chasis, New York, presented a paper on "Pathogenesis of Hypertension," which was discussed by Dr. Stanley E. Bradley, New York.

Dr. Louis N. Katz, Chicago, presented a paper on "Newer Approaches to the Pathogenesis of Atherosclerosis."

Dr. William B. Wartman, Chicago, presented a paper on "The Pathology of Arteriosclerosis." This paper was discussed by Drs. H. T. Blumenthal, St. Louis, and L. L. Waters, New Haven, Conn.

Dr. Ancel Keys, Minneapolis, presented a paper on "Cholesterol, Giant Molecules and Atherosclerosis," which was discussed by Dr. Irvine H. Page, Cleveland.

Drs. Howard Burchell, E. V. Allen and F. P. Moersch, Rochester, Minn., presented a paper on "The Clinical Manifestations of Arteriosclerosis." This paper was discussed by Drs. Francis M. Forster, Washington, D. C.; Francis C. Wood, Philadelphia, and Louis N. Katz, Chicago.

Dr. Irvine H. Page, Cleveland, presented a paper on "Current Treatment of Hypertension," which was discussed by Drs. Robbert W. Wilkins, Boston; Frederick M. Allen, New York, and Herbert Chasis, New York.

SECTION ON LARYNGOLOGY, OTOLOGY AND RHINOLOGY

WEDNESDAY, JUNE 13—MORNING

The meeting was called to order at 9 o'clock by the chairman, Dr. J. Milton Robb, Detroit.

Drs. Edmund P. Fowler and Adolf Zeckel, New York, presented a paper on "Psychosomatic Aspects of Ménière's Disease." This paper was discussed by Drs. Adolf Zeckel, New York, and Norton Canfield, New Haven, Conn.

Drs. Francis H. McGovern, Danville, Va., and G. Slaughter Fitz-Hugh, Charlottesville, Va., presented a paper on "Herpes Zoster of the Cephalic Extremity." On motion of Dr. Edmund P. Fowler, seconded by Dr. Norton Canfield, New Haven, Conn., it was voted to allow Dr. William C. Thornell, Cincinnati, to read the discussion of this paper, prepared by Dr. Kurt Tschiassny, Cincinnati, who was unable to be present.

Dr. Marvin F. Jones, New York, presented a paper on "Allergy of the Upper Respiratory Tract: Its Cure by Surgery Plus Antiallergic Methods." This paper was discussed by Drs. Irving W. Voorhees and L. L. Coleman, New York; Sacks Bricker, Philadelphia, and Henry M. Scheer, New York.

Drs. Frederick R. Guilford, Houston, Texas, and C. O. Haug, Galveston, Texas, presented a paper on "The Diagnosis of Deafness in the Very Young Child Aided by the Use of a New Instrument, the Pediacoumeter." This paper was discussed by Drs. Edmund P. Fowler, New York; Stanley Macht, Hagerstown, Md.; Sam H. Sanders, Memphis, Tenn., and Frederick R. Guilford, Houston, Texas.

Dr. Raymond E. Jordan, Pittsburgh, presented a paper on "The Role of Allergy in Otology," which was discussed by Drs. Erhart Ruedemann, Pittsburgh; Francis Davison, Danville, Pa., and Raymond E. Jordan, Pittsburgh.

THURSDAY, JUNE 14—MORNING

Dr. Gordon F. Harkness, Davenport, Iowa, gave his report as delegate to the House of Delegates.

The following officers were elected: chairman, Dr. Carl H. McCaskey, Indianapolis; vice chairman, Dr. Fred W. Dixon, Cleveland; secretary, Dr. Sam H. Sanders, Memphis, Tenn.; representative to the Scientific Exhibit, Dr. Francis W. Davison, Danville, Pa., and representative to the American College of Surgeons, Dr. Louis H. Clerf, Philadelphia.

Dr. O. E. Hallberg, Rochester, Minn., presented a paper on "Nosebleed and Its Treatment," which was discussed by Drs. D. H. Anthony, Memphis, Tenn.; William C. Thornell, Cincinnati; Hyman I. Goldstein, Camden, N. J.; Joseph I. Kemler, Baltimore; John J. Rainey, Troy, N. Y.; Ernest Reeves, Passaic, N. J., and O. E. Hallberg, Rochester, Minn.

Dr. De Graaf Woodman, New York, presented a paper on "Congenital Atresia of the Auditory Canal," which was discussed by Drs. George L. Pattee, Denver; Edgar M. Holmes, Boston; Frederick R. Guilford, Houston, Texas, and De Graaf Woodman, New York.

Dr. J. Milton Robb, Detroit, read his chairman's address, "Are You an Otolaryngologist?"

Dr. I. Mathews Robison, Houston, Texas, presented a paper on "Pressure Treatment of Maxillary Sinusitis." This paper was discussed by Dr. George S. McReynolds, Galveston, Texas.

The chairman, Dr. J. Milton Robb, read a report from the American Board of Otolaryngology.

FRIDAY, JUNE 15—MORNING

Dr. Daniel C. Moore, Seattle, presented a paper on "A Technic of Anesthesia for Long and/or Technically Difficult Ophthalmologic and Otolaryngologic Surgical Procedures." This paper was discussed by Drs. Paul B. MacCready, New Haven, Conn.; P. L. Munday, Camp Carson, Colo.; Joseph I. Kemler, Baltimore, Md.; Frank D. Lathrop, Boston; James B. Costen, St. Louis; Henry M. Scheer, New York, and Daniel C. Moore, Seattle.

Dr. Gabriel F. Tucker, Philadelphia, presented a paper on "Diagnosis and Treatment of Cancer of the Larynx: Methods of Cure: Median Thyrotomy, Laryngectomy, Irradiation and Irradiation with Surgery." This paper was discussed by Drs. Edwin N. Broyles, Baltimore; Murdock S. Equen, Atlanta, Ga.; Joseph I. Kemler, Baltimore; Frederick M. Allen, New York; Henry B. Orton, Newark, N. J., and Gabriel F. Tucker, Philadelphia.

Drs. Lawrence Reynolds, K. E. Corrigan and H. S. Hayden, Detroit, presented a paper on "Use of Radioactive Isotopes for Differential Diagnosis of Malignant and Nonmalignant Lesions in the Throat," which was discussed by Drs. Wadsworth Warren and J. Milton Robb, Detroit.

Dr. Bruce Proctor, Detroit, presented a paper on "Surgical Anatomy of the Neck." This paper was discussed by Drs. James E. Croushore, Detroit, and Henry B. Orton, Newark, N. J.

SECTION ON MISCELLANEOUS TOPICS

Session on Allergy

WEDNESDAY, JUNE 13—AFTERNOON

The meeting was called to order at 2 o'clock by the chairman, Dr. Samuel M. Feinberg, Chicago.

A round table discussion on "ACTH and Cortisone in Allergic Diseases" was conducted by Dr. Robert A. Cooke and Dr. Marion B. Sulzberger, New York.

Dr. John H. Mitchell, Columbus, Ohio, presented a paper on "Antihistamines in Allergic Disorder," which was discussed by Dr. Carl E. Arbesman, Buffalo, and Dr. Mitchell.

Dr. Samuel M. Feinberg, Chicago, delivered the chairman's address: "Allergy Therapy; Some Common Misconceptions," which was discussed by Dr. Horace S. Baldwin, New York.

Dr. Oren C. Durham, Chicago, read a paper on "Pollen Prevalence and Pollen-Free Areas." This paper was discussed by Dr. Lawrence J. Halpin, Cedar Rapids, Iowa.

Drs. Karl D. Figley and Frank F. A. Rawling, Toledo, Ohio, presented a paper on "Diagnostic Methods in Food Allergy," which was discussed by Dr. Mary H. Loveless, New York.

Sessions on Military Medicine

THURSDAY, JUNE 14—AFTERNOON

The meeting was called to order at 2:10 p. m. by the chairman, Dr. Russel V. Lee, Palo Alto, Calif.

Dr. Richard L. Meiling, Washington, D. C., presented a paper on "The Changing Military Medical Picture in the United

States of America." This paper was discussed by Drs. Paul I. Robinson; Harry Armstrong, and H. Lamont Pugh, Washington, D. C.

Dr. E. R. Hering, Korea, read a paper on "Combat Medical Experience," which was discussed by Drs. Oral B. Bolibaugh, San Francisco, and William D. Preston, Washington, D. C.

Dr. Truman Blocker, Galveston, Texas, read a paper on "Treatment of Burns." This paper was discussed by Drs. Edwin J. Pulaski, San Antonio, Texas; Everett I. Evans, Richmond, Va.; Paul E. Spangler, Norfolk, Va., and Frederick M. Allen, New York.

Dr. Bertram Groesbeck, Washington, D. C. read a paper on "Survival, Rescue and Resuscitation." This paper was discussed by Drs. Ray G. Daggs, Fort Knox, Ky., and Alonzo A. Towner, Washington, D. C.

Dr. Howard A. Rusk, New York, read a paper on "Procurement, Assignment and Utilization of Reserve Medical Officers," which was discussed by Drs. Paul I. Robinson, Wallace H. Graham, and C. W. Stelle, Washington, D. C.

A paper on "Cold Injuries with Emphasis on Frostbite" was presented. This paper was discussed by Drs. Everett Homer Dickinson, Oakland, Calif.; Kurt Lange, New York; Francis S. Adams, Pueblo, Colo.; Robert B. Lewis, Randolph Field, Texas, and Kenneth D. Orr, U. S. Army.

FRIDAY, JUNE 15—AFTERNOON

The meeting was called to order at 2 o'clock by the vice chairman, Dr. Francis B. Berry, New York.

Dr. Wilfred Hall, Washington, D. C., presented a paper on "Air Evacuation," which was discussed by Drs. Bertram Groesbeck, Washington, D. C., and Byron L. Steger, Baltimore.

Dr. Thomas L. Willmon, New London, Conn., presented a paper on "Man and the Submarine," which was discussed by Dr. Ebbe C. Hoff, Richmond, Va.

Dr. James J. Sapero, Cairo, Egypt, presented a paper on "Communicable Diseases of Africa and the Middle East." This paper was discussed by Dr. Joseph E. Smadel and Dr. John S. Paul, Washington, D. C.

Dr. Edward J. Kendricks, Washington, D. C., presented a paper on "Practical Problems in Aviation Medicine," which was discussed by Dr. Ashton Graybiel, Pensacola, Fla.

Dr. Franklin C. McLean, Chicago, presented a paper on "Progress in the Prevention and Treatment of Radiation Injury." This paper was discussed by Dr. Harry H. Haight, Washington, D. C.

Dr. August W. Spittler, Washington, D. C. presented a paper on "Orthopedic Problems in the Field," which was discussed by Drs. Chalmers Carr, Washington, D. C., and Oscar Reeder, Phoenixville, Pa.

The chairman announced that the Council on Scientific Assembly had agreed to appoint the following physicians as officers of the newly formed Section on Military Medicine: Chairman, Dr. Melvin A. Casberg, St. Louis; vice chairman, Dr. Richard A. Kern, Philadelphia; secretary, Dr. Sheldon S. Brownton, Fort Slocum, N. Y.

Dr. Russel V. Lee, Palo Alto, Calif., was elected delegate.

SECTION ON NERVOUS AND MENTAL DISEASES

WEDNESDAY, JUNE 13—AFTERNOON

The meeting was called to order at 2 o'clock by the chairman, Dr. Louis J. Karnosh, Cleveland.

A paper entitled "Psychiatric Treatment in General Hospitals in the United States and Canada," was presented by Drs. A. E. Bennett, Bernice Engle, and Eugene A. Hargrove, Berkeley, Calif. This paper was discussed by Drs. Baldwin L. Keyes, Philadelphia, and A. E. Bennett, Berkeley, Calif.

Dr. Eugene Ziskind, Los Angeles, read a paper entitled "The Cure of Emotional and Social Etiological Factors in Medical Patients." This paper was discussed by Dr. James P. Scanlon, Washington, D. C., and Dr. Ziskind.

Dr. Edward A. Strecker, Philadelphia, read a paper entitled "Therapeutic Aspects of Alcoholism," which was discussed by Drs. Frederick Lemere, Seattle; Robert V. Seliger, Baltimore; Arthur M. Sackler, New York and Dr. Strecker.

A "Report of the Section Committee Concerning the Licensure or Certification of Clinical Psychologists," was presented by Dr. Francis J. Gerty, Mr. J. W. Holloway and Dr. R. P. Mackay, Chicago.

A paper entitled "The Psychiatric Manifestations of Acute Pancreatitis," was presented by Drs. Charles Savage and Wendell A. Butcher, Bethesda, Md., and Douglas Noble, Washington, D. C., and was discussed by Drs. Edward Weiss, Philadelphia; George N. Raines, Washington, D. C., and Dr. Noble.

Drs. Robert A. Matthews and Ian P. Stevenson, New Orleans, presented a paper entitled "Theory and Fact in Psychosomatic Medicine." This paper was discussed by Drs. David McK. Rioch, Washington, D. C.; Francis J. Gerty, Chicago, and Dr. Stevenson.

A paper entitled "The Psychiatric Aspects of Cortisone and ACTH Administration," was presented by Drs. Francis J. Braceland and Howard P. Rome, Rochester, Minn., and was discussed by Dr. Cecil L. Wittson, Omaha, and Dr. Braceland.

THURSDAY, JUNE 14—AFTERNOON

The following officers were elected: chairman, Dr. Frank H. Luton, Nashville, Tenn.; vice chairman, Dr. A. Earl Walker, Baltimore; secretary, Dr. Francis M. Forster, Washington, D. C.; representative to American Board of Psychiatry and Neurology, Dr. Francis J. Gerty, Chicago; delegate, Dr. Hans H. Reese, Madison, Wis.; alternate delegate, Dr. Paul C. Bucy, Chicago; chairman of Scientific Exhibits, Dr. Leon Whitsell, San Francisco.

On motion of Dr. George N. Raines, Washington, D. C., seconded by Dr. Percival Bailey, Chicago, it was voted unanimously to accept the report of the Section Committee Concerning the Licensure or Certification of Clinical Psychologists as an expression of the point of view of the section, and that the report be transmitted to the Director of the Bureau of Legal Medicine and Legislation of the American Medical Association, with the recommendation that it be adopted as the official point of view of the American Medical Association and be implemented by appropriate action of the American Medical Association.

On motion of Dr. Robert T. Morse, Washington, D. C., seconded by Dr. Daniel Blain, Washington, D. C., it was voted unanimously that the chairman appoint a committee of not less than three or more than five members to serve, through the annual session in 1954, in an advisory capacity to the Bureau of Legal Medicine and Legislation of the American Medical Association and to report to the Section at each annual session on matters pertaining to the legal control and practice of clinical psychology.

Dr. Percival Bailey, Chicago, section delegate, reported on actions of the House of Delegates.

A motion by Dr. Roland P. Mackay, Chicago, to request the House of Delegates not to change the name of the section was duly seconded and carried.

Dr. Francis J. Braceland, Rochester, Minn., gave a report on the American Board of Psychiatry and Neurology.

Dr. Francis M. Forster, secretary, read a report on the American Board of Neurology.

Dr. Percival Bailey, Chicago, presented a resolution requesting the House of Delegates to seek legislation permitting civilians with severe transverse lesions of the spinal cord to be admitted to paraplegic wards of veterans hospitals. The resolution was adopted on motion duly made, seconded and carried.

Dr. Louis J. Karnosh, Cleveland, presented the chairman's address, "Neurology and Human Emotions."

Dr. Alexander T. Ross, Indianapolis, read a paper on "Comparative Incidence of Residual Defects Following Serum, Sulfonamide and Sulfapenicillin Therapy for Meningococcic Meningitis." This paper was discussed by Drs. Ellsworth C. Alvord, Washington, D. C.; Roland P. Mackay, Chicago, and Dr. Ross.

A paper entitled "The Effects of Pituitary Adrenocorticotropic Hormone (ACTH) and Cortisone on Disorders of the Nervous System," was presented by Drs. Gilbert H. Glaser and H. Houston Merritt, New York, and was discussed by Drs. Donald McEachern, Montreal, Can.; Roland P. Mackay, Chicago; Nathan S. Schlezinger, Philadelphia, and Drs. Merritt and Glaser.

Drs. Morris J. Tissenbaum, Harry M. Harter and Arnold P. Friedman, New York, presented a paper entitled "Organic Neurologic Syndromes Diagnosed as Functional Disorders." This paper was discussed by Drs. Russell M. DeJong, Ann Arbor, Mich.; Johannes M. Nielsen, Los Angeles, and Dr. Friedman.

Dr. Elinor R. Ives, Los Angeles, read a paper on "Comparison of the Efficacy of Various Drugs in the Treatment of Epilepsy," which was discussed by Drs. Jerome K. Merlis, Framingham, Mass.; Daniel Sciarra, New York, and David R. Talbot, San Diego, Calif.

Dr. Nathan S. Schlezinger, Philadelphia, read a paper entitled "The Present Status of Therapy in Myasthenia Gravis." This paper was discussed by Drs. Robert S. Schwab, Boston; Clark H. Millikan, Rochester, Minn., and Dr. Schlezinger.

FRIDAY, JUNE 15—AFTERNOON

The chairman appointed the following as a committee to serve in connection with the program outlined by the special Committee on Licensure or Certification of Clinical Psychologists: Dr. Daniel Blain, chairman, Washington, D. C.; Dr. Paul E. Huston, Iowa City; Dr. Philip Q. Roche, Philadelphia, and Dr. Manfred S. Guttmacher, Baltimore.

Dr. Joseph P. Evans, Cincinnati, read a paper entitled "Acute Head Injury," which was discussed by Drs. E. Jefferson Browder, Brooklyn, and Robert A. Groff, Philadelphia.

A paper entitled "X-Ray Visualization of the Intervertbral Disc 'Discography,'" was presented by Drs. W. James Gardner, R. E. Wise, E. C. Weiford, and C. R. Hughes, Cleveland. This paper was discussed by Drs. Edward Chamberlain, Philadelphia; Frederick P. Moersch, Rochester, Minn.; Ralph B. Cloward, Honolulu, and Dr. Gardner.

Drs. E. A. Spiegel, H. T. Wycis, and Herbert Freed, Philadelphia, presented a paper entitled "Stereoencephalotomy (Thalamotomy and Related Procedures)." This paper was discussed by Drs. J. W. Papez, Columbus, Ohio; John Hunter, Montreal, Canada, and Dr. Spiegel.

Dr. H. Russell Meyers, Iowa City, read a paper entitled "The Surgical Treatment of Epilepsy: Remarks Concerning Current Premises and Criteria for Evaluation End Results," which was discussed by Dr. Herbert Jasper, Montreal, Canada; A. Earl Walker, Baltimore, and Dr. Meyers.

Dr. James W. Watts, Washington, D. C., read a paper entitled "Psychosurgery: Accomplishments, Limitations and Risks in the Management of Intractable Pain." This paper was discussed by Drs. Yale D. Koskoff, Pittsburgh, and Gilbert Horrax, Boston.

Dr. Michael M. Scott, Philadelphia, read a paper entitled "Cerebral Apoplexy Due to Intracranial Hemorrhage: The Life-Saving Value of Surgical Intervention." This paper was discussed by Drs. Lester A. Mount, New York; Stephen E. Gurdjian, Detroit; H. Russell Meyers, Iowa City, and Dr. Scott.

SECTION ON OBSTETRICS AND GYNECOLOGY

WEDNESDAY, JUNE 13—MORNING

The meeting was called to order at 9 o'clock by the chairman, Dr. Arthur B. Hunt, Rochester, Minn.

Dr. Clarence C. Briscoe, Philadelphia, read a paper on "The Use of Intravenous Iron in the Practice of Obstetrics and Gynecology," which was discussed by Dr. Harvey B. Matthews, Brooklyn.

Drs. Milton L. McCall and Harry W. Taylor, Philadelphia, presented a paper on "The Effect of Barbiturate Sedation on the Brain in Toxemia of Pregnancy." This paper was discussed by Dr. Thaddeus L. Montgomery, Philadelphia.

Drs. Henry B. Turner and Frank E. Whitacre, Memphis, Tenn., presented a paper on "Changes in the Treatment of Eclampsia," which was discussed by Drs. Charles H. Peckham, Manchester, Conn.; Thomas K. Preston, Anthony, N. M., and B. H. Passmore, San Antonio, Texas.

Drs. H. Bristol Nelson, Brookline, Mass., and Priscilla White, Boston, presented a paper on "The Management of Pregnancy in the Diabetic Patient." This paper was discussed by Drs. Samuel A. Cosgrove, Jersey City, N. J., and Priscilla White, Boston.

Drs. William Mulligan and John Rock, Brookline, Mass., presented a paper on "The Response of Human Ovaries to Hypophysial Gonadotropins." This paper was discussed by Drs. Elmer Louis Sevringhaus, Nutley, N. J., and M. Edward Davis, Chicago.

Dr. Robert J. Lowrie, New York, presented a paper on "Frigidity in Women," which was discussed by Drs. Sophia J. Kleegman and Anna Kleegman Daniels, New York.

THURSDAY, JUNE 14—MORNING

The following officers were elected: chairman, Dr. Louis H. Douglass, Baltimore; vice chairman, Dr. Albert W. Holman, Portland, Ore.; secretary, Dr. Bernard J. Hanley, Los Angeles; delegate, Dr. Harvey B. Matthews, Brooklyn; alternate delegate, Dr. Daniel G. Morton, Los Angeles; representative to the Scientific Exhibit, Dr. Frederick H. Falls, Chicago. Also elected were: representative to the Board of Governors of the American College of Surgeons, Dr. Willard R. Cooke, Galveston, Texas; representatives to the American Board of Obstetrics and Gynecology; Dr. F. Bayard Carter, Durham, N. C., Dr. Robert A. Kimbrough Jr., Philadelphia, and Dr. Robert L. Faulkner, Cleveland; representatives to the American Committee on Maternal Welfare, Dr. William Benbow Thompson, Los Angeles, Dr. Robert D. Mussey, Rochester, Minn., and Dr. Oren Moore, Charlotte, N. C.; representative to the Board of Governors of the National Federation of Obstetric-Gynecologic Societies, Dr. Ralph E. Campbell, Madison, Wis.

The section went on record at favoring the International Recommendations on Definitions of Live Birth and Fetal Death as presented in U. S. Public Health Service publication No. 39.

The section endorsed the new classification of cervical carcinoma as approved at the Fourth American Congress on Obstetrics and Gynecology, May 14-19, 1950.

On motion of Dr. Emil Novak, Baltimore, seconded by Dr. Alfred J. Kobak, Chicago, it was voted to adopt a resolution requesting the Board of Trustees to allocate additional funds to each section sufficient in amount to pay the expenses in full or in part of the section delegates to the American Medical Association sessions.

Dr. Arthur B. Hunt, Rochester, Minn., presented the chairman's address, entitled "Experiences with Test of Labor; Evaluation of Its Present Worth."

Dr. Albert Sharman, Glasgow, Scotland, presented a paper on "Some Therapeutic Experiments in Female Infertility."

Drs. Douglas M. Haynes, Dallas, Texas; W. W. Brown, Waco, Texas; Richard L. Hermes, Lawrence, Kans., and C. R. Bates Jr. and William F. Mengert, Dallas, Texas, presented a paper on "Cytology for Early Detection of Uterine Cancer." This paper was discussed by Drs. Charles E. Smith, Chicago; John R. Graham, Boston, and Sophia J. Kleegman, New York.

Drs. Gerald A. Galvin, Howard W. Jones and Richard W. TeLinde, Baltimore, presented a paper on "The Clinical Relationship Between Carcinoma in Situ and Invasive Carcinoma of the Cervix." This paper was discussed by Drs. James A. Corscaden, New York; Jacob Hoffman, Philadelphia; Charles S. Stevenson, Detroit; Emil Novak, Baltimore, and Carl Henry Davis, Miami, Fla.

Drs. Alfred J. Kobak, Charles Fields and James E. Fitzgerald, Chicago, presented a paper on "Chemo-Antibiotics and Low Cervical Cesarean Section in Dystocia or Intrapartum Sepsis." This paper was discussed by Drs. Gordon Douglas, New York; Arthur B. Hunt, Rochester, Minn.; J. Bay Jacobs, Washington, D. C., and Bernard J. Hanley, Los Angeles.

Dr. H. L. Stewart Jr. presented a paper on "The Duration of Pregnancy and Postmaturity," which was discussed by Dr. Allan C. Barnes, Columbus, Ohio.

FRIDAY, JUNE 15—MORNING

Drs. Richard Torpin and Alva M. H. Faulkner, Augusta, Ga., presented a paper on "Further Studies in Regard to the Influence of the Placental Site on Fetal Presentation." This paper was discussed by Dr. Charles S. Stevenson, Detroit.

Drs. George Schaefer, Forest Hills, N. Y., and Harry H. Epstein, Jamaica, N. Y., presented a paper on "Therapeutic Abortion in Pulmonary Tuberculosis," which was discussed by Dr. Edward W. Hayes, Monrovia, Calif.

Drs. Harry Sered, Frederick H. Falls and Bruce P. Zummo, Chicago, presented a paper on "Further Observations in the Management of Gynecologic Tuberculosis with Streptomycin." This paper was discussed by Dr. Paula M. Horn, Los Angeles, and Dr. Albert Sharman, Glasgow, Scotland.

Drs. W. H. Grimes, R. A. Bartholomew, E. D. Colvin, John S. Fish, and William M. Lester, Atlanta, Ga., presented a paper on "Management of Breech Presentation in Pregnancy and Labor." This paper was discussed by Drs. Milton G. Potter, Buffalo; Bernard J. Hanley, Los Angeles, and Frederick H. Falls, Chicago.

Drs. S. Leon Israel and Alfred S. Conston, Philadelphia, presented a paper on "Unrecognized Pituitary Necrosis (Sheehan's Syndrome): A Cause of Sudden Death." This paper was discussed by Dr. David N. Danforth, Evanston, Ill., and Dr. Arthur B. Hunt, Rochester, Minn.

Dr. Charles Newberger, Chicago, presented a paper on "Maternal Mortality in Downstate Illinois: A Three-Year Review, 1948-1950," which was discussed by Drs. Philip F. Williams, Philadelphia; Frederick H. Falls, Chicago, and Michael S. Rapp, Staten Island, N. Y.

COMBINED MEETING OF SECTION ON OPHTHALMOLOGY WITH ASSOCIATION FOR RESEARCH IN OPHTHALMOLOGY

Association for Research in Ophthalmology

WEDNESDAY, JUNE 13—MORNING

The meeting was called to order at 9:30 a. m. by the chairman of the Association for Research in Ophthalmology, Dr. Kenneth C. Swan, Portland, Ore.

Dr. Robert J. Masters, Indianapolis, chairman of the Section on Ophthalmology, expressed gratification on behalf of the section that the Association for Research in Ophthalmology had accepted the invitation of the section to meet with it.

Dr. K. W. Ascher, Cincinnati, read a paper on "Aqueous Veins and Contact Lenses," which was discussed by Drs. Georgiana Theobald, Oak Park, Ill.; Ludwig von Sallman, Joseph I. Pascal, and John M. McLean, New York, and K. W. Ascher, Cincinnati.

Drs. Gordon S. Christiansen and P. J. Leinfelder, Iowa City, presented a paper on "A Critical Study of Lens Metabolism: (1) Nonenzymatic 'Respiration'; (2) Glycolysis." This paper was discussed by Drs. John Harris, Washington, D. C.; John Bellows, Chicago; William Hart, Philadelphia; Jonas S. Friedenwald, Baltimore; V. Everett Kinsey, Detroit, and Gordon S. Christiansen, Iowa City.

Dr. Peter C. Kronfeld, Chicago, read a paper on "The Chemical Demonstration of Transconjunctival Passage of Aqueous After Antiglaucomatous Operations," which was discussed by Drs. Harold G. Scheie, Philadelphia, and Peter C. Kronfeld, Chicago.

Drs. Jay G. Linn Jr. and Raymond C. Tomarelli, Pittsburgh, presented a paper entitled "An Evaluation of the Various Anticholinesterase Agents." This paper was discussed by Drs. W. Morton Grant, Boston, and Jay G. Linn Jr., Pittsburgh.

WEDNESDAY, JUNE 13—AFTERNOON

Drs. M. L. Stillerman, E. L. Gibbs and Meyer Perlstein, Chicago, presented a paper on "Encephalographic Changes in Strabismus." This paper was discussed by Drs. George Guibor, Chicago; Donald Lyle, Cincinnati; Arthur Linksz, New York; Harold Falls, Ann Arbor, Mich., and M. L. Stillerman, Chicago.

Drs. Franklin P. Bousquet and William E. Laupus, New York, presented a paper on "Retrolental Fibroplasia: The Role of Hemorrhage in Its Pathogenesis," which was discussed by Drs. Frederick H. Verhoeff and Parker Heath, Boston; Harold Falls, Ann Arbor, Mich.; Jonas Friedenwald, Baltimore, and Franklin P. Bousquet, New York.

Dr. John W. Patterson, Cleveland, read a paper on "Diabetic Cataract Formation," which was discussed by Drs. Ludwig von Sallman, New York; David G. Cogan, Boston, and John W. Patterson, Cleveland.

Drs. Seymour P. Halbert and Lois Swick, New York, presented a paper on "Antibiotic-Producing Bacteria of the Ocular Flora." This paper was discussed by Drs. Henry F. Allen, Boston; Alson E. Braley, Iowa City, and Seymour P. Halbert, New York.

Dr. Joseph V. M. Ross, Berwick, Pa., read a paper on "Polymyxin in Experimental Ocular Pseudomonas Aeruginosa Infections."

Dr. Robert L. Wiggins, New York, read a paper on "Experimental Studies on the Eye with Polymyxin B."

These two papers were discussed by Drs. Henry F. Allen, Boston; Alson E. Braley, Iowa City, and Ludwig von Sallman, New York.

THURSDAY, JUNE 14—MORNING

Dr. Glenn O. Dayton Jr., Buffalo, read a paper on "The Effect of ACTH on Experimentally Produced Exophthalmus," which was discussed by Drs. Lorand V. Johnson, Cleveland; John M. McLean, New York; John W. Henderson, Rochester, Minn., and Glenn O. Dayton Jr., Buffalo.

Dr. Gordon L. Walls, Berkeley, Calif., read a paper on "The Lateral Geniculate Nucleus and Visual Histophysiology," which was discussed by Drs. Donald Lyle, Cincinnati; David G. Cogan, Boston; Jonas S. Friedenwald, Baltimore; Arthur Linksz, New York, and Gordon L. Walls, Berkeley, Calif.

Drs. Albert M. Potts and Lorand V. Johnson, with the technical assistance of Doris Goodman, Cleveland, presented a paper on "Studies on the Visual Toxicity of Methyl Alcohol: The Effect of Methyl Alcohol and Its Oxidation Products on Some Retinal Metabolic Processes."

Drs. Anita P. Gilger, Albert M. Potts and Lorand V. Johnson, Cleveland, presented a paper on "Studies on the Visual Toxicity of Methyl Alcohol: The Effect of Parenterally Administered Substances on the Systemic Toxicity of Methyl Alcohol."

These two papers were discussed by Drs. Virgil G. Casten, Boston; P. J. Leinfelder, Iowa City; Jonas S. Friedenwald, Baltimore; David G. Cogan, Boston; Gordon L. Walls, Berkeley, Calif.; Walter H. Fink, Minneapolis, and Albert M. Potts and Anita P. Gilger, Cleveland.

Dr. Warner K. Noell, Randolph Field, Texas, read a paper on "Electrophysiological Study of the Retina During Metabolic Impairment," which was discussed by Drs. J. E. Lebensohn, Chicago, and William J. Holmes, Honolulu.

Drs. C. G. Smith and C. D. Baird, Toronto, Canada, presented a paper on "The Effect of Experimental Ischemia on the Retinal Cells Due to Intraocular-Pressure Increase." This paper was discussed by Drs. Derrick Vail, Chicago; P. Robb McDonald, Philadelphia; A. Alexander Knapp, New York; Henri Pichette, Quebec City, Canada, and C. G. Smith, Toronto, Canada.

Section on Ophthalmology

THURSDAY, JUNE 14—AFTERNOON

The meeting was called to order at 2 o'clock by the chairman, Dr. Robert J. Masters, Indianapolis.

The chairman announced with regret that Dr. Holger Ehlers, Copenhagen, Denmark, would be unable to attend the meeting due to pressure of duties at home. He presented two foreign guests, Dr. Antonio Grignolo, Parma, Italy, and Dr. Florian Verrey, Zurich, Switzerland.

Dr. M. Hayward Post, St. Louis, chairman of the executive committee of the section, presented the Prize in Ophthalmology to Dr. Georgiana Dvorak Theobald, Chicago.

The chairman's address was read by Dr. Robert J. Masters, Indianapolis.

Dr. W. Morton Grant, Boston, read a paper on "Clinical Measurements of Aqueous Outflow," which was discussed by Drs. Jonas S. Friedenwald, Baltimore; Paul A. Chandler, Boston; Peter C. Kronfeld, Chicago; K. W. Ascher, Cincinnati, and Thomas M. D'Angelo, Flushing, New York.

Drs. Solomon S. Brav and H. Peter Kirber, Philadelphia, presented a paper on "Mass Screening for Glaucoma." This paper was discussed by Drs. Peter C. Kronfeld, Chicago; Adolph Posner, New York; H. Saul Sugar, Detroit; Franklin M. Foote, New York; Louis Lehrfeld, Philadelphia; Harold P. Falls, Ann Arbor, Mich.; K. W. Ascher, Cincinnati, and Solomon S. Brav, Philadelphia.

The chairman, Dr. Robert J. Masters, Indianapolis, read a communication from Dr. George F. Lull, Secretary of the American Medical Association, regarding the American Medical Education Foundation.

Dr. Everett L. Goar, Houston, Texas, read a paper on "Rheumatoid Nodules of the Eye," which was discussed by Drs. Frederick H. Verhoeff, Boston; Merrill J. King, Brookline, Mass.; A. Alexander Knapp, New York, and Everett L. Goar, Houston, Texas.

Dr. Arthur A. Siniscal, Rolla, Mo., read a paper on "Sulfonamides and Antibiotics in Trachoma," which was discussed by Drs. Alson E. Braley, Iowa City; Henry F. Allen, Boston; Frederick H. Theodore, New York, and Arthur A. Siniscal, Rolla, Mo.

Dr. Florian Verrey, Zurich, Switzerland, presented a film on "The Cytology of the Aqueous Humor."

FRIDAY, JUNE 15—MORNING

EXECUTIVE SESSION

The Executive Session was called to order at 9 o'clock by the chairman, Dr. Robert J. Masters, Indianapolis.

The secretary, Dr. Trygve Gundersen, Boston, read the report of the American Committee on Optics and Visual Physiology, which was accepted and filed, on motion duly seconded and carried.

Dr. Algernon B. Reese, chairman, read the report of the Committee for the Award of the Knapp Medal for the Year 1950. On motion of Dr. Everett L. Goar, seconded by Dr. Parker Heath and carried, the report was received and filed.

In the absence of the chairman, Dr. Phillips Thygeson, Dr. Gundersen read the report of the Committee on the American Board of Ophthalmology. There being no objection, the report was received and filed.

Dr. Parker Heath, consultant, read the Report of the Registry of Ophthalmic Pathology. Without objection, the report was received and filed.

Dr. Gundersen read the report of the Exhibit Committee, of which Dr. Georgiana D. Theobald is chairman. There being no objection, the report was received and filed.

Dr. Gundersen read the report of the Committee on Museum of Ophthalmic History. Without objection, the report was received and filed.

Dr. Parker Heath read the report on the Knapp Testimonial Fund. Dr. Arthur Bedell moved that the Section on Ophthalmology record its thanks to the Kresge Foundation for its generous contribution. The motion was duly seconded and carried.

Dr. M. Hayward Post, delegate to the 16th International Congress of Ophthalmology, read his report. At the conclusion of the report, Dr. Post gave special recognition to the great service that Dr. Bernard Samuels has done for American ophthalmology in bringing the next International Congress to this country. Without objection, Dr. Post's report was received and filed.

Dr. Post moved that the executive committee be empowered to contact Prof. Eduoard Hart of Paris with an application by the section for membership in the International Federation of Ophthalmological Societies. The motion was seconded by Dr. Everett L. Goar and carried.

The report of Dr. A. D. Ruedemann, chairman of the Joint Committee on Industrial Ophthalmology of the American Medical Association and the American Academy of Ophthalmology and Otolaryngology, was received and filed.

Dr. Post read the report of the executive committee, which was received. In receiving the report, the section elected the officers nominated by the committee, as follows: chairman, Dr. Edwin B. Dunphy, Boston; vice chairman, Dr. Georgiana Dvorak Theobald, Oak Park, Ill.; secretary, Dr. Trygve Gundersen, Boston; delegate, Dr. William L. Benedict, Rochester, Minn.; alternate delegate, Dr. Harvey E. Thorpe, Pittsburgh.

In connection with the announcement of an invitation to attend a meeting of the Viennese Ophthalmological Society honoring the one hundredth anniversary of the birth of Prof. Ernst Fuchs, Dr. Dorman Pischel, San Francisco, offered the following resolution which was unanimously adopted:

> WHEREAS, The visit to the United States in 1921 by Prof. Ernst Fuchs was a great stimulus to the further development of ophthalmology in this country; and
>
> WHEREAS, Many of the members of this Section had an opportunity to meet this distinguished ophthalmologist whom they now remember with great respect and affection; and
>
> WHEREAS, All ophthalmologists in the United States appreciate the great and lasting contributions to ophthalmology made by him; therefore be it
>
> *Resolved,* That the Section on Ophthalmology of the American Medical Association send its greetings and best wishes to the Viennese Ophthalmological Society on the occasion of its celebration in honor of the one hundredth anniversary of the birth of Ernst Fuchs; and be it further
>
> *Resolved,* That this Section wishes to join with the Viennese Ophthalmological Society in paying respect to the memory of the illustrious Professor Ernst Fuchs.

On nominations made from the floor, the following were elected as the Committee for the Award of the Knapp Medal for 1951: Dr. Frederick A. Davis, Madison, Wis.; Dr. John H. Dunnington, New York, and Dr. Arthur J. Bedell, Albany, N. Y.

SCIENTIFIC SESSION

Dr. Charles L. Schepens, Boston, read a paper on "Subclinical Retinal Detachment," which was discussed by Drs. John H. Dunnington, New York; P. Robb McDonald, Philadelphia; S. Rodman Irvine, Baltimore; Harvey E. Thorpe, Pittsburgh; Henry Minsky, New York; Jonas S. Friedenwald, Baltimore; Florian Verrey, Zurich, Switzerland, and Charles L. Schepens, Boston.

Dr. Antonio Grignolo, Parma, Italy, read a paper on "Fibrous Components of the Vitreous Body." This paper was discussed by Drs. Ludwig von Sallman, New York; Jonas S. Friedenwald, Baltimore; Harvey E. Thorpe, Pittsburgh; Henry Minsky, New York, and Antonio Grignolo, Parma, Italy.

Dr. Alston Callahan, Birmingham, Ala., read a paper on "Lateral Cataract Extraction Following Filtering Operation," which was discussed by Drs. Frederick H. Verhoeff, Boston; Everett L. Goar, Houston, Texas; A. Alexander Knapp, New York; Samuel J. Meyer, Chicago, and Alston Callahan, Birmingham, Ala.

FRIDAY, JUNE 15—AFTERNOON

Dr. Walter H. Fink, Minneapolis, read a paper on "The Vertical Component in Strabismus," which was discussed by Drs. Francis H. Adler, Philadelphia; Lorand V. Johnson, Cleveland, and Walter H. Fink, Minneapolis.

Dr. Harvey E. Thorpe, Pittsburgh, read a paper on "ACTH and Cortisone in Ocular Surgery," which was discussed by Drs. R. Townley Paton and John M. McLean, New York, and Harvey E. Thorpe, Pittsburgh.

Drs. Algernon B. Reese, Frederick C. Blodi, William A. Silverman and John C. Locke, New York, presented a paper on "The Influence of ACTH on the Course of Retrolental Fibroplasia." This paper was discussed by Drs. Victor Everett Kinsey, Detroit; William C. Owens, Baltimore; Merrill J. King, Boston, and Algernon B. Reese, New York.

Dr. Irwin T. Mancall, Boston, read a paper on "Occlusion of the Central Retinal Vein," which was discussed by Drs. Angus L. MacLean, Baltimore, and Frederick H. Verhoeff, Boston.

Drs. Ivan F. Duff, Harold F. Falls and James W. Linman, Ann Arbor, Mich., presented a paper on "Anticoagulant Therapy in Occlusive Vascular Retinal Disease." This paper was discussed by Drs. Alexander E. MacDonald, Toronto, Canada; Irving H. Leopold, Philadelphia, and Harold F. Falls, Ann Arbor, Mich.

Drs. George M. Haik, Wood Lyda and Richey L. Waugh Jr., New Orleans, presented a paper on "Sympathetic Ophthalmia." This paper was discussed by Drs. Alan C. Woods, Baltimore; Paul A. Chandler, Boston; S. Rodman Irvine, Baltimore; Daniel M. Gordon, New York, and Wood Lyda, New Orleans.

SECTION ON ORTHOPEDIC SURGERY

WEDNESDAY, JUNE 13—MORNING

The meeting was called to order at 9 o'clock by the chairman, Dr. Walter P. Blount, Milwaukee.

The chairman announced that because of the absence of Dr. Joseph S. Barr, Boston, he had appointed the vice chairman, Dr. Frederic C. Bost, San Francisco, to serve on the executive committee.

Dr. Frank G. Murphy, Chicago, read a paper on "Complications of Nonunion of Fractures with Modern Treatment," which was discussed by Drs. George O. Eaton, Baltimore; Richard T. Hudson, Louisville, Ky., and Frank G. Murphy, Chicago.

Drs. George J. Garceau and Eugene Salvati, Indianapolis, presented a paper on "Complications of Orthopedic Surgical Procedures." This paper was discussed by Drs. I. William Nachlas, Baltimore; Frederick R. Thompson, New York, and George J. Garceau, Indianapolis.

Dr. Julius S. Neviaser, Washington, D. C., read a paper on "Acromioclavicular Dislocation Treated by Transference of the Coracoacromial Ligament," which was discussed by Drs. Andrew Schildhaus, Brooklyn, and August W. Spittler and Julius S. Neviaser, Washington, D. C.

Dr. Jesse T. Nicholson, Philadelphia, read a paper on "Glenoid Shelf Operation for Recurrent Dislocation of the Shoulder," which was discussed by Drs. Frederic C. Bost, San Francisco; J. Hamilton Allan, Charlottesville, Va., and Jesse T. Nicholson, Philadelphia.

Dr. Moore Moore Jr., Memphis, Tenn., read a paper on "Radiohumeral Synovitis," which was discussed by Drs. Milton C. Cobey, Washington, D. C.; Donald C. Conzett, Dubuque, Iowa, and Walter P. Blount, Milwaukee.

Dr. Henry Herman Young, Rochester, Minn., read a paper on "Nonneurologic Lesions Simulating Protruded Intervertebral Disk." This paper was discussed by Drs. David M. Bosworth, New York; Robert J. Joplin, Brookline, Mass., and Henry Herman Young, Rochester, Minn.

THURSDAY, JUNE 14—MORNING

The following officers were elected: chairman, Dr. Frederic C. Bost, San Francisco; vice chairman, Dr. Henry R. McCarroll, St. Louis; representatives to the American Board of Orthopedic Surgery, Mather Cleveland, New York, and Walter Graham, Santa Barbara, Calif; chairman, section committee on Scientific Exhibits, Dr. J. Vernon Luck, Los Angeles; delegate, Dr. Edward L. Compere, Chicago; alternate, Dr. Francis M. McKeever, Los Angeles.

Drs. F. P. Kreuz, G. W. Hyatt, T. C. Turner and C. A. L. Bassett, Bethesda, Md., presented a paper on "The Use of Preserved Tissues in Orthopedic Surgery." This paper was discussed by Drs. Philip D. Wilson, New York; Lenox D. Baker, Durham, N. C., and G. W. Hyatt, Bethesda, Md.

As a variation from the usual procedure, the author listed and the two discussants combined in writing a paper on "Medullary Fixation of the Femur: Indications, Technic, Complications and Errors," which was presented in succession by Drs. Edwin F. Cave, Boston; August W. Spittler, Washington, D. C. and Hugh M. A. Smith, Memphis, Tenn.

Dr. Edward L. Compere, Chicago, as the delegate of the section, reported extemporaneously on the work of the House of Delegates.

Dr. Henry R. McCarroll, St. Louis, moved that the Section on Orthopedic Surgery go on record as requesting the Board of Trustees of the American Medical Association to appropriate a sum of money to the section, of not less than $1500, for the section to use as it sees fit in defraying the necessary expenses of the section delegate to the House of Delegates. The motion was seconded by Dr. Samuel Kleinberg, New York, and carried.

Dr. Samuel Kleinberg, New York, moved that the section pass a resolution requesting that the By-Laws of the American Medical Association be amended to make the delegate of the section a member of the executive committee of the Section on Orthopedic Surgery. The motion was seconded by Dr. H. H. Young, Rochester, Minn., and carried unanimously.

Dr. Walter P. Blount, Milwaukee, read the chairman's address on "Control of Bone Length."

Drs. John G. Kuhns, Boston, and Robert S. Hormell, Brookline, Mass., presented a paper on "Congenital Scoliosis." This paper was discussed by Drs. Samuel Kleinberg, New York; Walter P. Blount, Milwaukee, and John G. Kuhns, Boston.

Dr. Jack K. Wickstrom, New Orleans, read a paper on "Rehabilitation of Civilian Amputees: An Evaluation of 235 Amputees and the Problems of Their Rehabilitation." This paper was discussed by Drs. T. Campbell Thompson, New York; Henry H. Kessler, Newark, N. J., and Jack K. Wickstrom, New Orleans.

FRIDAY, JUNE 15—MORNING

Dr. Leonard T. Peterson, Washington, D. C., read a paper on "Principles of Internal Fixation with Plates and Screws," which was discussed by Drs. Francis W. Glenn, Miami, Fla.; Vernon P. Thompson, Los Angeles; Elmer P. Weigel, Plainfield, N. J., and Leonard T. Peterson, Washington, D. C.

Drs. Maurice M. Pike and J. Whitfield Larrabee, Hartford, Conn., presented a paper on "The Use of Cancellous Bone Grafts in Those Fresh Fractures Which Come to Open Reduction." This paper was discussed by Drs. William J. Tobin, Washington, D. C. and Maurice M. Pike, Hartford, Conn.

Dr. Dana M. Street, Memphis, Tenn., read a paper on "Medullary Fixation in the Forearm," which was discussed by Drs. Donald T. Imrie, Vicksburg, Miss.; Henry R. McCarroll, St. Louis; Richard T. Hudson, Louisville, Ky., and Dana M. Street, Memphis, Tenn.

Drs. Carl E. Badgley and Sylvester J. O'Connor, Ann Arbor, Mich., presented a paper on "Conservative Treatment of Tibial Plateau Fractures." This paper was discussed by Drs. John R. Moore, Philadelphia; John T. Jacobs, Denver; David M. Bosworth, New York, and Sylvester J. O'Connor, Ann Arbor, Mich.

Drs. Rudolph S. Reich and Norman J. Rosenberg, Cleveland, presented a paper on "Fractures of the Patella." This paper was discussed by Drs. Luther M. Strayer Jr., Bridgeport, Conn.; J. Neill Garber, Indianapolis, and Norman J. Rosenberg, Cleveland.

Drs. William T. Green and Jonathan Cohen, Boston, presented a paper on "Osteoid Osteoma in Children." This paper was discussed by Drs. Edward L. Compere, Chicago; Robert B. Portis, Beverly Hills, Calif., and William T. Green, Boston.

SECTION ON PATHOLOGY AND PHYSIOLOGY

WEDNESDAY, JUNE 13—MORNING

The meeting was called to order at 9:10 a. m. by the chairman, Dr. Stanley P. Reimann, Philadelphia.

Dr. Carl J. Wiggins, Cleveland, read a paper entitled "The Regulation of Cardiac Performance: Facts vs. Theories," which was discussed by Drs. George E. Wakerlin, Chicago, and Robert W. Wilkins, Boston.

A paper entitled "Modern Concepts of Acid-Base Regulation" was read by Dr. Robert F. Pitts, Syracuse, N. Y., and was discussed by Drs. Campbell Moses, Pittsburgh, and William S. Hoffmann, Chicago.

Dr. Jesse P. Greenstein, Bethesda, Md., presented a paper on "Effect of Cancer on Liver Enzymes." This paper was discussed by Dr. Jacob Taub, New York.

A paper entitled "Tissue Reactions to a Bacterial Polysaccharide Used in the Chemotherapy of Malignant Tumors" was presented by Dr. Andrew J. Donnelly, Philadelphia, and was discussed by Drs. Herbert S. Bowman, Philadelphia; George E. Wakerlin, Chicago, and Jesse P. Greenstein, Bethesda, Md.

THURSDAY, JUNE 14—MORNING

The following officers were elected: chairman, Dr. Paul R. Cannon, Chicago; vice chairman, Dr. Lall G. Montgomery, Muncie, Ind.; secretary, Dr. Edwin F. Hirsch, Chicago; representative to Scientific Exhibit, Dr. Frank B. Queen, Portland, Ore.; representatives to American Board of Pathology, Drs. John Rudolf Schenken, Omaha, and Shields Warren, Boston.

The chairman, Dr. Stanley P. Reimann, Philadelphia, presented the chairman's address.

Dr. George E. Wakerlin, Chicago, read a paper entitled "The Kidney and Hypertension," which was discussed by Dr. Louis N. Katz, Chicago, and Drs. Stanley E. Bradley, Benjamin Jablons, Frederick M. Allen and Sidney A. Gladstone, New York.

A paper by Drs. Campbell Moses, Grace L. Rhodes, Evelyn Leatham and Robert S. George, Pittsburgh, entitled "The Effects of Cholesterol Feeding During Pregnancy on Blood Cholesterol, the Lipid Content of the Placenta and Placental Vascular Lesions" was presented, and was discussed by Drs. Ancel Keys, Minneapolis; Charles F. Wilkinson Jr., New York; Harry J. Corper, Denver; Laurance W. Kinsell, Oakland, Calif., and Campbell Moses, Pittsburgh.

Drs. Jacob Gershon-Cohen and Helen Ingleby, Philadelphia, presented a paper entitled "Comparative Radiology and Pathology of the Breast." This paper was discussed by Drs. Ernest E. Aegerter and Harold Isard, Philadelphia.

A paper entitled "A Study of the Mitochondria and Golgi Material in Neoplasms Arising in Human Tissues" by Drs. A. E. Bothe, A. J. Dalton and F. O. Zillessen, Philadelphia, was read, and was discussed by Dr. Harold Stewart, Bethesda, Md.

FRIDAY, JUNE 15—MORNING

Joint Meeting with Section on Gastro-Enterology and Proctology

Dr. Lester R. Dragstedt, Chicago, read a paper entitled "The Physiology of Gastric Secretion and Its Relation to the Ulcer Problem," which was discussed by Dr. George Crile Jr., Cleveland.

Dr. Richard B. Capps, Chicago, presented a paper on "Epidemiology of Acute Hepatitis." This paper was discussed by Drs. John R. Neefe, Philadelphia; Hyman I. Goldstein, Camden, N. J., and Richard B. Capps, Chicago.

A paper entitled "ACTH in Chronic Ulcerative Colitis: Clinical Observations," was presented by Dr. Joseph B. Kirsner, Chicago, and was discussed by Drs. J. Arnold Bargen, Rochester, Minn.; Walter L. Palmer, Chicago; Dr. Hyman I. Goldstein, Camden, N. J., and Joseph B. Kirsner, Chicago.

Dr. Yale Kneeland Jr., New York, presented a paper on "Antibiotics in Gastrointestinal Disorders." This paper was discussed by Dr. Z. T. Bercovitz, New York.

SECTION ON PEDIATRICS

WEDNESDAY, JUNE 13—AFTERNOON

The meeting was called to order at 2 o'clock by the chairman, Dr. Joseph B. Bilderback, Portland, Ore.

A panel discussion on The Therapy of Infectious Diseases was held, during which Dr. Waldo E. Nelson, Philadelphia, presided, and the following papers were presented:

Dr. Russell J. Blattner, Houston, Texas, read a paper on "Clinical Aspects of Host-Parasite Relationship."

Dr. Richard G. Hodges, Cleveland, read a paper on "Epidemiology of Upper Respiratory Diseases."

Dr. Waldo E. Nelson, Philadelphia, read a paper on "Clinical Bases for Selection of Patients for Antimicrobial Therapy."

Dr. Earle H. Spaulding, Philadelphia, read a paper on "Selection of Antimicrobial Agents by Laboratory Means."

The panel discussion was followed by a question and answer period, in which questions were presented from the floor, in written form, and were answered by the members of the panel.

THURSDAY, JUNE 14—AFTERNOON

The following officers were elected: chairman, Dr. Walter B. Stewart, Atlantic City, N. J.; vice chairman, Dr. Eugene T. McEnery, Chicago; secretary, Dr. Wyman C. C. Cole, Detroit; delegate, Dr. Woodruff L. Crawford, Rockford, Ill.; alternate delegate, Dr. Oliver L. Stringfield, Stamford, Conn.; alternate delegate to fill unexpired term of Dr. Julius Hess, now delegate because of resignation of Dr. William Weston Sr., Dr. Woodruff L. Crawford, Rockford, Ill.; custodian of the Abraham Jacobi Fund, Dr. Hugh L. Dwyer, Kansas City, Mo.; representative to Scientific Exhibit, Dr. F. Thomas Mitchell, Memphis, Tenn.

Dr. Hugh L. Dwyer, Kansas City, Mo., read the report on the Abraham Jacobi Fund.

The secretary, Dr. Wyman C. C. Cole, Detroit, announced that the preceding day the executive committee had authorized the Abraham Jacobi Fund to pay traveling expenses plus a $15 per diem to the delegate to the House of Delegates and also to the representative to the Scientific Exhibit.

The executive committee further directed that annual solicitation for contributions to the Abraham Jacobi Fund be made to the members and friends of the Section on Pediatrics, which was authorized by vote of the section at the Atlantic City session in 1949.

The following resolution was presented by Dr. F. Thomas Mitchell, Memphis, Tenn.:

> WHEREAS, It has been learned by the Section on Pediatrics of the American Medical Association in session at Atlantic City, N. J., June 13, 1951, that Dr. Alfred A. Walker is confined to his home because of serious illness, the membership wishes to convey to him the following resolution:
>
> *Resolved,* That those present in attendance at this meeting of the section wish to express their appreciation to him for his fellowship, friendship and long service and efficient capacity in the section, and wish him well in his present illness.

On motion of Dr. Mitchell, seconded by Dr. Margaret Mary Nicholson, Washington, D. C., the resolution was adopted.

Dr. James B. Stone, Richmond, Va., presented the following resolution:

> WHEREAS, Dr. William Weston Sr. has submitted his resignation as delegate from the section to the House of Delegates of the American Medical Association, after having filled this office faithfully and ably for over fifteen years; and
>
> WHEREAS, Both as a member of this section and as its former chairman, as well as its representative to the House of Delegates, his counsel has always been wise and constructive; and
>
> WHEREAS, During these years he has labored diligently and unceasingly to uphold the highest standards of the medical profession, has given many hours of hard work as well as utilized his unusual fount of knowledge, tact and experience for the betterment of pediatrics; and
>
> WHEREAS, His unfailing courtesy and his delightful sense of humor have made the path easier for many, as well as making himself honored and beloved by all who have had the privilege of knowing him; therefore be it
>
> *Resolved,* That the Section on Pediatrics now record its deep regret at his resignation and express its high esteem of him, and its deep appreciation of the services of this Christian gentleman.

On motion of Dr. Stone, seconded by Dr. Margaret Mary Nicholson, Washington, D. C., the resolution was adopted.

Dr. Margaret Mary Nicholson, Washington, D. C., presented the following resolution:

> WHEREAS, The past years have been fraught with danger from the activities of those persons who would replace voluntary medicine with politically controlled medicine; and
>
> WHEREAS, Those activities have been held in abeyance by the diligence, foresight and leadership of our President, Dr. Elmer L. Henderson; therefore be it
>
> *Resolved,* That the Section on Pediatrics now record its grateful appreciation of his outstanding work during the past year, which has been eminently successful.

On motion regularly made and seconded, the resolution was adopted.

Dr. Joseph B. Bilderback, Portland, Ore., read the chairman's address.

Drs. Tom D. Spies, Samuel Dreizen, George S. Parker and Donald J. Silberman, Birmingham, Ala., presented a paper on "Recent Observations in the Detection and Treatment of Nutritive Failure in Children." This paper was discussed by Dr. Arild E. Hansen, Galveston, Texas.

Drs. Werner Henle and Gertrude Henle, Philadelphia, presented a paper on "The Prevention of Mumps," which was discussed by Dr. Joseph Stokes Jr., Philadelphia.

Dr. Aims C. McGuinness, Philadelphia, read a paper on "A Review of Current Trends in Active and Passive Immunization," which was discussed by Drs. L. W. Sauer, Evanston, Ill.; James P. Leake, Washington, D. C., and Joseph Stokes Jr., Philadelphia.

Dr. Vida H. Gordon, Little Rock, Ark., read a paper on "Infantile Eczema: Management in Pediatric Practice and Prophylactic Measures for Control of Future Allergic Disease."

Dr. Jerome Glaser, Rochester, N. Y., read a paper on "The Use of ACTH and Cortisone in the Treatment of Bronchial Asthma and Eczema in Pediatric Practice."

Drs. Leon Unger, Albert H. Unger and A. Alvin Wolf, Chicago, presented a paper on "The Treatment and Results of Treatment of Bronchial Asthma in Children."

These three papers were discussed by Drs. George L. Waldbott, Detroit; Theron G. Randolph, Chicago; Morton Zall, Los Angeles, and M. Murray Peshkin, New York.

FRIDAY, JUNE 15—AFTERNOON

Dr. Jay M. Arena, Durham, N. C., read a paper on "Household Poisoning in Children."

Dr. Philip M. Stimson, New York, read a paper on "Treatment of Acute Poliomyelitis," which was discussed by Dr. Horace L. Hodes, New York.

Dr. Arild E. Hansen, Galveston, Texas, read a paper on "The New Challenge for Early Diagnosis in Acute Rheumatic Fever." This paper was discussed by Drs. William Weston Jr., Columbia, S. C., and George M. Wheatley, New York.

Dr. Samuel Livingston, Baltimore, read a paper on "The Medical Management of Epilepsy," which was discussed by Dr. H. M. Keith, Rochester, Minn.

Drs. Charles U. Lowe and Charles D. May, Minneapolis, presented a paper on "The Treatment of Chronic Idiopathic Intestinal Insufficiency (Celiac Disease)." This paper was discussed by Drs. L. Emmett Holt Jr., and Merrill P. Haas, New York, and Charles U. Lowe, Minneapolis.

Dr. Walter Finke, Rochester, N. Y., read a paper on "Childhood Pneumonia: A Common Cause of Bronchopulmonary Disease," which was discussed by Dr. Camille D. Cayley, New York.

SECTION ON PHYSICAL MEDICINE AND REHABILITATION

WEDNESDAY, JUNE 13—MORNING

The meeting was called to order at 9:15 a. m. by the chairman, Dr. George Morris Piersol, Philadelphia.

A paper entitled "Treatment of Some Complications of Colles' Fracture" was presented by Drs. Miland E. Knapp and Myron D. Lecklitner, Minneapolis.

Dr. Jessie Wright, Pittsburgh, read a paper on "Protective Body Mechanics in Arthritis," which was discussed by Dr. Edward E. Gordon, New York.

A paper on "Physical Medicine Plus Cortisone for Rheumatoid Arthritis,"was presented by Drs. Gordon M. Martin, Howard F. Polley and Thomas P. Anderson, Rochester, Minn., and was discussed by Dr. Walter M. Solomon, Cleveland.

Drs. Edward E. Gordon and Karl E. Carlson, New York, presented a paper on "Changing Attitudes Toward Multiple Sclerosis: A Program of Management." This paper was discussed by Drs. Howard A. Rusk, New York, and Frank H. Clark, Cleveland.

A paper on "Physical Medicine and Rehabilitation: Dynamic Therapy in Chronic Illness," was read by Dr. A. B. C. Knudson, Washington, D. C., and was discussed by Dr. Sydney S. Norwick, San Francisco.

Dr. Daniel Dancik, Northport, N. Y., read a paper on "Physical Medicine and Rehabilitation: Its Contribution and Role in a Large Psychiatric Hospital."

THURSDAY, JUNE 14—MORNING

Dr. George Morris Piersol, Philadelphia, read the chairman's address, entitled "The Present Obligation of Physical Medicine and Rehabilitation."

Dr. William Bierman, New York, read a paper on "Bell's Palsy," which was discussed by Drs. Sedgwick Mead, St. Louis; Ferdinand F. Schwartz, Birmingham, Ala.; Samuel Feuer, Brooklyn; Samuel J. Rosen, Pittsburgh; Frank R. Ober, Boston, and Madge C. McGuinness, New York.

Drs. John H. Kuitert and Raoul C. Psaki, Washington, D. C., presented a paper on "Common Diseases and Disabilities of the Hand," which was discussed by Dr. Herman Baezy, Dayton, Ohio.

Dr. Donald L. Rose, Kansas City, Kans., read a paper on "Rehabilitation of Hand Function in Rheumatoid Arthritis."

Dr. H. Worley Kendell, Chicago, presented a paper on "The Prevention and Correction of Deformities in Rheumatoid Arthritis with Assistive Devices."

The last two papers were discussed by Drs. David H. Kling, Los Angeles; Madge C. McGuinness, New York, and Frank H. Clark, Cleveland.

FRIDAY, JUNE 15—MORNING

Dr. Arthur L. Watkins, Boston, read a paper entitled "Practical Applications of Progressive Resistance Exercises."

Dr. Herman Schwan, Philadelphia, read a paper entitled "Limitations of Ultrasonics in Medicine."

Dr. M. A. Perlstein, Chicago, read a paper entitled "Some Clinical Aspects of Cerebral Palsy."

Dr. Henry H. Kessler, Newark, N. J., read a paper entitled "Rehabilitation of the Amputee."

Dr. Robert L. Bennett, Warm Springs, Ga., read a paper entitled "Functional Apparatus for Severely Weakened Upper Extremities."

A paper entitled "Bracing of Soft Tissue Disabilities of the Upper Extremity" was presented by Drs. Charles D. Shields and E. M. Smith, Washington, D. C., and was discussed by Drs. Gerald G. Hirschberg, New York, and Charles D. Shields, Washington, D. C.

SECTION ON PREVENTIVE AND INDUSTRIAL MEDICINE AND PUBLIC HEALTH

WEDNESDAY, JUNE 13—MORNING

The meeting was called to order at 9 o'clock by the chairman, Dr. Rutherford T. Johnstone, Los Angeles.

Dr. Rutherford T. Johnstone read his chairman's address entitled "Medicine: A Critique with No Tongue in Cheek."

The following papers were read as a symposium on "Occupational Health of Medical Personnel":

"Laboratory Infections," by Dr. S. Edward Sulkin, Dallas, Texas.

"Tuberculosis in Nurses and Medical Students," by Dr. H. D. Lees, Philadelphia.

"Professional Dermatitis," by Dr. Ervin H. Epstein, Oakland, Calif.

"Occupational Diseases of Dentists," by Dr. F. J. Orland, Chicago.

"Radiation Exposure in Atomic Medicine Nursing," by Dr. Marshall H. Brucer, Oak Ridge, Tenn.

"Diseases Acquired by Veterinary Surgeons," by Dr. R. C. Klussendorf, Terre Haute, Ind.

These six papers were discussed by Drs. Louis I. Dublin, New York, and Seward E. Miller, Washington, D. C.

THURSDAY, JUNE 14—MORNING

The following papers were read as a symposium on "Aging":

"Orientation in Problems of Aging," by Dr. Robert A. Moore, St. Louis.

"Psychiatric Aspects of Aging," by Dr. Leonard E. Himler, Ann Arbor, Mich.

"Public Health and Statistical Aspects of Aging," by Dr. Clarence J. Velz, Ann Arbor, Mich.

"Industrial Medical Aspects of Aging," by Dr. S. Charles Franco, New York.

"Sociological Aspects of Aging," by Miss Ollie A. Randall, New York.

"Training for Retirement of the Aged," by Dr. Phil N. Scheid, Chicago.

These six papers and remarks by Dr. Theodore G. Klumpp, moderator, were discussed by Drs. Harold W. Lovell, New

York; Clark Tibbitts, Washington, D. C.; O. L. Friedman, New York; I. J. Brightman, Albany, N. Y., and Daniel Blain, Washington, D. C.

Dr. Leon Pordy, New York, presented a paper on "The Value of Cardiac Function Tests in Industry." This paper was discussed by Dr. Morris E. Missal, Rochester, N. Y.; Dr. S. Charles Franco, New York, and Dr. Pordy.

The following officers were elected: chairman, Dr. Carey P. McCord, Detroit; vice chairman, Dr. Vlado A. Getting, Boston; secretary, Dr. Jean S. Felton, Oak Ridge, Tenn.; delegate, Dr. Rutherford T. Johnstone, Los Angeles; representative to Scientific Exhibit, Dr. Paul A. Davis, Akron, Ohio.

Friday, June 15—Morning

The following papers were read as a symposium on "A Critical Evaluation of Public Health Programs" with Dr. Herman E. Hilleboe, Albany, N. Y., as moderator:

"Venereal Disease Control," by Dr. John J. Wright, Chapel Hill, N. C.

"Nutrition," by Dr. Norman Jolliffe, New York.

"Tuberculosis Case Finding and Control," by Dr. W. C. Spring Jr., Ithaca, N. Y.

"Cancer Case Finding and Control," by Dr. N. E. McKinnon, Toronto, Canada.

"Responsibilities in Hospital Construction," by Dr. Robin C. Buerki, Philadelphia.

These papers were discussed by Drs. Theodore H. Noehren, Salt Lake City; Henry A. Holle, New York, and I. J. Brightman, Albany, N. Y.

SECTION ON RADIOLOGY

Wednesday, June 13—Afternoon

The meeting was called to order at 2 o'clock by the chairman, Dr. J. C. Dickinson, Tampa, Fla.

The secretary, Dr. Paul C. Hodges, Chicago, read the report of the delegate to the House of Delegates, embodying a resolution relative to the use of radium and radio-isotopes in hospitals. On motion regularly made and seconded, the resolution was adopted.

Dr. J. C. Dickinson, Tampa, Fla., read the chairman's address, "The General Practice of Radiology."

Dr. Ross Golden, New York, read a paper on "Functional Obstruction of the Efferent Loop of the Jejunum Following Partial Gastrectomy."

Drs. James F. Martin, Winston-Salem, N. C., and Hymer L. Friedell, Cleveland, presented a paper on "Partial Obstruction of the Small Bowel with Special Reference to the Obstructing Segment."

Drs. Everett L. Pirkey, Edsell S. Reed, William H. Smith and Gabriel Whiteman, Louisville, Ky., presented a paper on "The 'Profile Line' in the Differential Diagnosis of Intrinsic and Extrinsic Lesions of the Gastric Cardia."

Drs. Gladden V. Elliott and Hugh M. Wilson, St. Louis, presented a paper on "Mesenchymal Tumors of the Stomach."

Drs. Fred J. Hodges and Howard C. MacMillan, Ann Arbor, Mich., presented a paper on "Important Clinical Dividends from X-Ray Examinations of the Colon."

These papers were discussed by Drs. Fred J. Hodges, Ann Arbor, Mich.; Paul C. Swenson, Philadelphia, and Walter F. Gruber, New York.

Thursday, June 14—Afternoon

The following officers were elected: chairman, Dr. Ira H. Lockwood, Kansas City, Mo.; vice chairman, Dr. Paul C. Hodges, Chicago; secretary, Dr. Traian Leucutia, Detroit; representative to the Scientific Exhibit, Dr. Richard H. Chamberlain, Philadelphia.

Drs. C. F. Behrens, D. P. Jackson, E. P. Cronkite and J. G. Jacobs, Bethesda, Md., presented a paper on "Evaluation of the Platelet Role in the Hemorrhagic Phase of Radiation Injury."

Dr. Milton Friedman, New York, read a paper on "Seminoma of the Testis."

Dr. William Harris, New York, read a paper on "Use of a Grid in Roentgen Therapy for Advanced Cancer."

Drs. Ira I. Kaplan and Leslie L. Allen, New York, presented a paper on "Hodgkin's Disease: A Review of 242 Cases Treated in the Bellevue Hospital Radiation Therapy Department."

Drs. Roger A. Harvey, John S. Laughlin, Hugh Garrison and John R. Anderson, Chicago, presented a paper on "Comparison of Dose Distribution in Patients Treated with X-Ray Beams of Widely Different Energies."

Dr. Leonard B. Goldman, Jackson Heights, N. Y., read a paper on "Use of Lipids to Enhance the Effect of Roentgen Therapy in the Treatment of Pain from Advanced Cancer."

These papers were discussed by Drs. Hirsch Marks, and William Harris, New York, and Lester M. Freedman, Pittsburgh.

Friday, June 15—Afternoon

Dr. Rieva Rosh, New York, read a paper on "Irradiation of Recurrent and Residual Carcinoma of the Cervix After a Total and Subtotal Hysterectomy."

Drs. William B. Seaman and Alfred Goldman, St. Louis, presented a paper on "Roentgenographic Aspects of Pulmonary Arteriovenous Fistulas."

Drs. Edwin L. Lame and Hon Chong Chang, Philadelphia, presented a paper on "Pubic and Ischial Necrosis Following Pelvic Operation (Osteitis Pubis)."

Drs. Wallace S. Tirman and Harry W. Banker, Bluffton, Ind., presented a paper on "Microradiography."

Drs. Israel Steinberg and Charles T. Dotter, New York, presented a paper on "Lung Cancer: Diagnostic and Prognostic Value of Angiocardiography."

Drs. Laurence L. Robbins and Edwin H. Land, Boston, presented a paper on "The Application of the Land Method of Film Processing in Roentgenography."

These papers were discussed by Drs. Fred J. Hodges, Ann Arbor, Mich.; Paul C. Hodges, Chicago; Oscar V. Batson, Philadelphia, and Laurence Miscall, New York.

SECTION ON SURGERY, GENERAL AND ABDOMINAL

Wednesday, June 13—Afternoon

The meeting was called to order at 2 o'clock by the chairman, Dr. I. S. Ravdin, Philadelphia.

Dr. William A. Altemeier, Cincinnati, presented a paper on "Enzymatic Debridement of Thermal Wounds," which was discussed by Drs. Edwin J. Pulaski, San Antonio, Texas, and Louis M. Rousselot, New York.

Drs. Raymond M. Curtis, John H. Brewer and Ira W. Rose Jr., Baltimore, presented a paper on "A New Technic for the Local Treatment of Burns." This paper was discussed by Drs. Walter E. Fleischer and Harvey B. Stone, Baltimore; Irving L. Ochs, Annapolis, Md.; Paul E. Spangler, Portsmouth, Va., and Frederick M. Allen, New York.

Dr. James Barrett Brown, St. Louis, presented a paper on "Rehabilitation of Patients with Deep Burns," which was discussed by Dr. Herbert Conway, New York.

Drs. Joseph M. Miller, Perrin H. Long and Edward S. Stafford, Baltimore, presented a paper on "Streptokinase and Streptodornase in the Treatment of Infected Wounds." This paper was discussed by Drs. W. Ross McCarty and Frank B. Berry, New York; Michael E. DeBakey, Houston, Texas, and Otto C. Brantigan, Baltimore.

Drs. D. Emerick Szilagyi, Rajka R. Margulis and Roy D. McClure, Detroit, presented a paper on "Pituitary Adrenocorticotropic Hormone (ACTH) and Cortisone in the Management of Postoperative Complications and Related Problems." This paper was discussed by Drs. David M. Hume, Boston, and Geza DeTakats, Chicago.

Drs. Stanley R. Friesen and William N. Harsha, Kansas City, Kans., presented a paper on "Massive Generalized Wound Bleeding During Operation with Clinical and Experimental Evidence of Blood Transfusion Reactions." This paper was discussed by Drs. Jonathan E. Rhoads, Philadelphia, and J. Garrott Allen, Chicago.

THURSDAY, JUNE 14—AFTERNOON

The following officers were elected: chairman, Dr. I. Mims Gage, New Orleans; vice chairman, Dr. R. K. Gilchrist, Chicago; secretary, Dr. I. Ridgeway Trimble, Baltimore; representative on the American Board of Surgery, Dr. John Waugh, Rochester, Minn.; representative to the Scientific Exhibit, Dr. Walter G. Maddock, Chicago; delegate, Dr. Grover C. Penberthy, Detroit; alternate, Dr. Isaac A. Bigger, Richmond, Va.

Dr. I. S. Ravdin, Philadelphia, presented the chairman's address, entitled "The Responsibility of the Surgeon to Modern Society."

Drs. Waltman Walters, James T. Priestley and Hiram H. Belding III, Rochester, Minn., presented a paper on "Vagotomy in the Treatment of Gastrojejunal Ulceration: A Postoperative Clinical and Laboratory Study (A Study of 103 Cases)." This paper was discussed by Drs. I. Ridgeway Trimble, Baltimore; Lester R. Dragstedt, Chicago; Sara M. Jordan, Boston, and Hyman I. Goldstein, Camden, N. J.

Drs. Owen H. Wangensteen and Thomas O. Murphy, Minneapolis, presented a paper on "Gastric Resection with Restoration of Anatomic Continuity for Peptic Ulcer." This paper was discussed by Drs. Ralph Colp, New York; Lester R. Dragstedt, Chicago, and Richard B. Cattell, Boston.

Dr. Henry G. Hollenberg, Little Rock, Ark., read a paper on "Bleeding from the Nipple," which was discussed by Drs. William T. Fitts Jr., Philadelphia, and John V. Goode, Dallas, Texas.

Drs. Thomas J. E. O'Neill, Robert P. Glover and Charles P. Bailey, Philadelphia, presented a paper on "Observations on the Surgical Treatment of Mitral Stenosis by Commisurotomy." This paper was discussed by Drs. George D. Geckeler, Philadelphia, and Claude S. Beck, Cleveland.

FRIDAY, JUNE 15—AFTERNOON

Drs. Robert M. Zollinger and Mary M. Martin, Columbus, Ohio, presented a paper on "Surgical Aspects of Hypersplenism." This paper was discussed by Dr. Louis M. Rousselot, New York.

Drs. Arthur H. Blakemore, Stanley E. Bradley, Hugh F. Fitzpatrick, Cheves M. Smythe and Samuel R. Powers Jr., New York, presented a paper on "Physiological Studies on the Portal System in Cases of Portal Hypertension Requiring a Portacaval Anastomosis." This paper was discussed by Drs. Robert R. Linton, Brookline, Mass., and Ralph A. Deterling, New York.

Dr. Richard B. Cattell, Boston, read a paper on "Factors Influencing Prognosis in Carcinoma of the Colon and Rectum," which was discussed by Drs. Harry J. Warthen, Richmond, Va., and Samuel McLanahan Jr., Baltimore.

Dr. Frank J. McGowan, New York, read a paper on "More Frequent Use of Anterior Resection in the Sigmoid Colon for Cases of Recurrent or Chronic Diverticulitis." This paper was discussed by Drs. Frank Glenn and Louis M. Rousselot, New York.

Drs. Harry E. Bacon, Philadelphia, and Lloyd F. Sherman, Minneapolis, presented a paper on "The Surgical Management of Anomalies of the Anus, Rectum and Sigmoid Colon," which was discussed by Dr. Monte Edwards, Baltimore.

Drs. Morris L. Parker and Gerald J. Menaker, Chicago, presented a paper on "Evaluation of Indications for Exploration of the Common Duct." This paper was discussed by Drs. Leo M. Zimmerman, Chicago, and Richard B. Cattell, Boston.

SECTION ON UROLOGY

WEDNESDAY, JUNE 13—MORNING

The meeting was called to order at 9:05 a. m. by the chairman, Dr. John Arthur Taylor, New York.

Dr. Oswald S. Lowsley, New York, read a paper entitled "Further Experiences with the Fat-Ribbongut Method of Repairing Kidney Wounds."

A paper entitled "Rupture of the Urethra at the Apex of the Prostate," was presented by Drs. John K. Ormond and Philip W. Fairey, Detroit.

These two papers were discussed by Drs. Albert E. Goldstein, Baltimore; George A. Fiedler, New York; Harold P. McDonald, Atlanta, Ga.; E. J. McCague, Pittsburgh; Oswald S. Lowsley, New York, and John K. Ormond, Detroit.

Dr. Robert B. McIver, Jacksonville, Fla., read a paper entitled "Surgery of the Fused Kidney."

A paper entitled "Nephrostomy Drainage with Ureteral Splint in Renal Surgery," was presented by Drs. H. Haynes Baird and Hamilton W. McKay, Charlotte, N. C.

A paper entitled "Infection in Urinary Tract Calculi: Incidence and Management," was presented by Drs. James C. Kimbrough and William H. Morse, Washington, D. C.

These three papers were discussed by Drs. David M. Davis, Philadelphia; Oswald S. Lowsley, New York; Henry K. Sangree, Philadelphia, and Harold P. McDonald, Atlanta, Ga., and Drs. McIver, McKay and Kimbrough.

A paper entitled "The Clinical Effect of Estrogen Therapy on Metastatic Lesions from Carcinoma of the Testis," was presented by Drs. Charles H. de T. Shivers and Herbert B. Axilrod, Atlantic City, N. J.

Dr. William P. Herbst, Washington, D. C., read a paper entitled "Metabolic Management of Advanced Prostatic Malignancy."

These two papers were discussed by Drs. Edward N. Cook, Rochester, Minn., and William A. Milner, Albany, N. Y., and Drs. Shivers and Herbst.

THURSDAY, JUNE 14—MORNING

The following officers were elected: chairman, Dr. John R. Hand, Portland, Ore.; vice chairman, Dr. Rex Van Duzen, Dallas, Texas; secretary, Dr. Earl E. Ewert, Boston; delegate, Dr. Jay J. Crane, Los Angeles; alternate, Dr. Rex Van Duzen, Dallas, Texas; representative to Scientific Exhibit, Dr. Roger W. Barnes, Los Angeles.

A paper entitled "Treatment of Benign Prostatic Hypertrophy: Evaluation of the Transurethral, Perineal and Retropubic Methods," was presented by Drs. Kent A. Alcorn and Marshall W. Alcorn, Bay City, Mich.

Dr. Willard E. Goodwin, Baltimore, read a paper entitled "Surgical Problems Encountered in Radical Prostatectomies After Previous Operation on the Prostate."

Dr. Vernon S. Dick, Boston, read a paper entitled "Unrecognized Prostatism."

These three papers were discussed by Drs. Lowrain E. McCrea, Philadelphia; Samuel A. Vest, Charlottesville, Va.; Charles A. W. Uhle, Philadelphia; Roger W. Barnes, Los Angeles; Albert E. Goldstein, Baltimore; John K. Ormond, Detroit; John L. Emmett, Rochester, Minn.; Jay J. Crane, Los Angeles; Ralph Hathaway Jenkins, New Haven, Conn.; Marshall W. Alcorn, Bay City, Mich.; Willard E. Goodwin, Baltimore, and Vernon S. Dick, Boston.

A paper entitled "Atrophic Pyelonephritis vs. Congenital Hypoplasia," was presented by Drs. John L. Emmett, J. J. Alvarez and John R. McDonald, Rochester, Minn.

A paper entitled "A Classification of Uremia and Differential Diagnosis of the Causes of Uremia," was presented by Drs. Roger W. Barnes, Walter E. Macpherson, R. Theodore Bergman and Gordon Hadley, Los Angeles.

These two papers were discussed by Drs. William J. Engel, Cleveland; Edward H. Ray, Lexington, Ky.; Samuel E. Kramer, Perth Amboy, N. J.; John L. Emmett, Rochester, Minn., and Roger W. Barnes, Los Angeles.

Dr. Jay J. Crane, delegate, gave a short report on the activities of the House of Delegates.

Dr. C. D. Creevy, Minneapolis, read a paper entitled "Some Factors in Absorption After Ureterosigmoidostomy."

Dr. Walter M. Kearns, Milwaukee, read a paper entitled "Ureteral Intestinal Anastomosis."

These two papers were discussed by Drs. Clarence G. Bandler, New York; James C. Kimbrough, Washington, D. C.; C. D. Creevy, Minneapolis, and Walter M. Kearns, Milwaukee.

FRIDAY, JUNE 15—MORNING

A joint meeting was held with the Section on Anesthesiology. The proceedings are reported in the minutes of that section.

MEDICAL NEWS

CALIFORNIA

Society News.—New officers of the Los Angeles Obstetrical and Gynecological Society are Dr. Gordon Rosenblum, president, and Dr. Aaron N. Webb, secretary-treasurer.

State Medical Election.—The California Medical Association at its meeting May 13-16 installed Dr. H. Gordon MacLean, Oakland, as president and chose Dr. Lewis A. Alesen, Los Angeles, president-elect, and Dr. Donald A. Charnock, Los Angeles, speaker of the house of delegates.

ILLINOIS

University Appointment.—Dr. George G. Jackson, Boston, has been appointed assistant professor of preventive medicine at the University of Illinois College of Medicine. Dr. Jackson held joint appointments as Milton fellow in medicine at Harvard, research fellow at the Thorndike Memorial Laboratory, and assistant in medicine at Boston City Hospital.

Chicago

New Biochemistry Department.—The departments of chemistry and experimental medicine at Northwestern University Medical School are being combined into the department of biochemistry. Dr. Smith Freeman, who has been professor and chairman of the department of experimental medicine, has been named chairman of the newly established department.

Northwestern Names Abbott Professors.—Abbott Professors for the academic year 1951-52 at Northwestern University's Medical School are Dr. Carl A. Dragstedt, professor and chairman of the department of pharmacology; Henry B. Bull, Ph.D., professor in the department of chemistry; Fred S. Grodins, Ph.D., professor in the department of physiology, and Dr. E. Albert Zeller, associate professor in the department of chemistry. The four men will engage in medical research made possible by a $1,500,000 gift Northwestern received in 1939 from the estate of the late Clara A. Abbott, widow of Dr. Wallace C. Abbott.

Personals.—Dr. Jules H. Masserman, associate professor of nervous and mental diseases at Northwestern University and scientific director of the National Foundation for Psychiatric Research, has been appointed consultant to the secretariat of the United Nations and designated by the World Health Organization to present a series of lectures at universities throughout Europe and Scandinavia in October and November. Dr. Masserman will also address the British Royal Society.——Dr. Ole C. Nelson, medical director of Cook County Hospital, was guest of honor at a dinner June 13 marking the 41st year of his employment at the hospital. Dr. Nelson has been medical director since December 1943.

KANSAS

State Medical Election.—At the annual meeting of the Kansas Medical Society in Topeka, May 14-17, Dr. Clarence H. Benage, Pittsburg, was installed as president. Elected officers include Dr. Warren F. Bernstorf, Winfield, president-elect; Dr. John L. Lattimore, Topeka, treasurer, and Dr. John M. Porter, Concordia, delegate to the American Medical Association 1952-1954, with Dr. Peter E. Hiebert, Kansas City, as alternate.

MASSACHUSETTS

New Home Care Program.—Massachusetts General Hospital is to begin a new home care program to carry the services of the institution to needy families in the surrounding area. The plan, which is part of a 10-year program for improvement of basic care, teaching, and research, is expected to make better supervision of treatment possible and "make unnecessary many admissions to the hospital and permit patients to go home much earlier."

MICHIGAN

Dr. Deyton to Direct Multiple Sclerosis Center.—Dr. John W. Deyton, Detroit, has been appointed medical director of the Detroit Multiple Sclerosis Center, Detroit Memorial Hospital, succeeding Dr. Abe S. Goldstein, who has gone into private practice but will continue as consultant at the center. It is reported that thus far 370 of the state's estimated 4,000 sclerosis victims have been examined at the center.

Dr. Foster Made Emeritus Professor.—Dr. Linus J. Foster, who is retiring from active teaching this summer after 25 years at the Wayne University College of Medicine, Detroit, has been made *emeritus professor of clinical neurology and psychiatry.* Dr. Foster joined the college of medicine staff as an instructor in clinical neurology and psychiatry in 1926. He was promoted to assistant professor in 1931 and to professor in 1936.

MISSOURI

Dr. Proetz Receives Award.—Dr. Arthur W. Proetz, St. Louis, was recently awarded the De Roaldes gold medal of the American Laryngological Association. The award, made only six times previously since its establishment in 1907, is made "in special recognition of merit and achievement in teaching, authorship, and research." Dr. Proetz is professor of clinical otolaryngology at Washington University School of Medicine, is author of "Physiology of the Nose," and has written chapters and sections in numerous textbooks and monographs.

Gift of Roentgenograms for Teaching.—Dr. LeRoy Sante, professor of radiology at St. Louis University School of Medicine, has presented the school with some 1,500 miniature roentgenographs to be used in teaching the principles of roentgenologic interpretation. Selected x-rays from those compiled over 35 years of practice were reduced in size and filed in proper sequence, so that it is now possible to show students the original roentgenograms of a case and follow an illness to completion through the changes which occurred. Dr. Sante estimates it took most of his spare time over a period of two or three years to edit the series, sort it, and place the films in the order in which they should be used.

NEW YORK

Dr. Willard Named Dean at Syracuse.—Dr. William Robert Willard, formerly associate professor of public health and assistant dean in charge of postgraduate medical education at the Yale University School of Medicine has been appointed dean of New York State University College of Medicine at Syracuse. This position was vacated by the resignation of Dr. Herman G. Weiskotten, who has served the college as dean for 25 years. Dr. Willard was graduated cum laude from Yale with the M.D. degree in 1934 and the doctor of public health degree three years later. He interned at Johns Hopkins Hospital. Following a period as deputy state and county health officer in Maryland, he was surgeon in the U. S. Public Health Service. With the U. S. Army he was assigned to malaria control work.

Symposium on Pediatrics.—This symposium is being presented before the Suffolk County Medical Society on July 25 at 10 a. m. in the Central Islip State Hospital in Central Islip. Speakers include:

Horace L. Hodes, Manhasset, Common Forms of Meningitis.
Bernard Benjamin, Brooklyn, Changing Concepts in Fluid Therapy in Pediatrics.
Thomas V. Santulli, New York, Common Pediatric Abdominal Surgery.

The symposium is part of the postgraduate instruction arranged by the Medical Society of the State of New York in cooperation with the New York State Department of Health.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

OHIO

Andrus Premedical Scholarship at Oberlin.—The establishment of a permanent premedical scholarship at Oberlin College in honor of the late Dr. William DeWitt Andrus, New York surgeon, was announced June 14. The scholarship, created by individual gifts from about 275 former patients, friends, and relatives of Dr. Andrus, will be awarded every two years to a second semester sophomore taking premedical work at Oberlin. Income from the scholarship endowment will assure, at the minimum, tuition for his junior and senior years. About 15% of the men in each sophomore class plan medical careers. Selection of the first Andrus Scholar will be made this spring by the Oberlin Men's Scholarship Committee with the assistance of premedical advisors. The scholar will be chosen on the basis of scholastic ability, aptitude for a career in medicine, character and citizenship, and financial need. Dr. Andrus took his premedical work at Oberlin College, and at the time of his death last Jan. 20 he was attending surgeon at the New York Hospital and professor of clinical surgery in Cornell University Medical College.

OKLAHOMA

Narcotic Violations.—Dr. Cosby Elwood Ford, Taft, on April 20 pleaded guilty to a violation of the federal narcotic law in the United States District Court at Muskogee. His sentence of 18 months was suspended, and he was placed on probation for three years and fined $300.

Dr. J. Walter Beyer, Tulsa, pleaded guilty to a violation of the federal narcotic law in the United States District Court at Tulsa, and on May 8 was sentenced to serve a term of two years.

PENNSYLVANIA

Heart Association Clinic.—The heart clinic, which was opened at the Pottsville Mission in Pottsville on June 14, will be open every Thursday morning to patients referred by their family physicians. It is being operated by Dr. Norman M. Wall and Dr. Joseph C. Koch, local physicians. The heart association will provide the services of specialists from metropolitan areas when such examination and treatment becomes necessary. Results of the examinations at the clinic will be referred to the family physician.

Philadelphia

Dr. Griffith Honored.—Ivor Griffith, Ph.D., who has just completed his 10th year as president of the Philadelphia College of Pharmacy and Science, was honored at the annual spring alumni reunion dinner of the college May 24. A tooled testimonial book and a doctor's cap and gown were among the presentations made to Dr. Griffith.

Laennec Society Prize.—The Laennec Society of Philadelphia will award a prize of $200 for the best paper submitted in any field related to diseases of the chest. This prize is open to undergraduates, interns, residents, or fellows throughout the United States. The work should be original and not a review of the literature or previous contributions. The society requests that the prize-winning paper be presented at one of its regular scientific meetings. Five copies of the manuscript should be submitted, double-spaced with wide margins, to Dr. Katharine R. Boucot, 311 S. Juniper St., Philadelphia 7, by Oct. 1.

New Aero-Medical Laboratory.—Dr. Robert F. Rushmer, of the University of Washington, Seattle, has been appointed superintendent of the scientific department of the Aviation Medical Acceleration Laboratory of the U. S. Navy, located at Johnsville, Pa. The appointment was made in accordance with an agreement signed by Harold E. Stassen, president of the University of Pennsylvania, and Captain Selden B. Spangler, whereby the university and the U. S. Naval Air Development Center have become affiliated. Personnel of the two institutions and the faculty of the university school of medicine will cooperate with the commander of NADC in the selection of personnel for the laboratory of the center. Dr. Rushmer has also been appointed professor of applied physiology on the faculty of the university's school of medicine; other appointees at the laboratory will receive appropriate faculty appointments in the university. One of the main functions of the new laboratory will be the study of man's reactions to acceleration under conditions resembling stress patterns encountered in air combat. It has been designed as a complete aero-medical laboratory well equipped for work in physiology, animal surgery, radioactivity, biophysics, biochemistry, gas analysis, pathology and electronics, and it also has a medical library, conference rooms, and service and fabrication shops. From 1940 to 1942 Dr. Rushmer was a fellow at the Mayo Clinic, Rochester, Minn., and in 1941 was appointed an assistant in aviation medicine. He served as a research projects officer, department of clinical investigation, with the School of Aviation at Randolph Field, Texas, from 1942 to 1946 inclusive. After the war Dr. Rushmer joined the medical faculty at the University of Southern California School of Medicine, Los Angeles, as an associate professor of aviation medicine and in 1947 went to the University of Washington to serve in the same field of activities.

SOUTH DAKOTA

State Medical Election.—At the annual meeting of the South Dakota State Medical Association in Aberdeen, June 2-6, Dr. David A. Gregory, Milbank, was installed as president. Elected officers include Dr. Roy E. Jernstrom, Rapid City, president-elect; Dr. Roland G. Mayer, Aberdeen, vice president; Dr. Louis J. Pankow, Sioux Falls, secretary-treasurer, and Dr. Alonzo P. Peeke, Volga, speaker of the house. The association's first annual award to the outstanding doctor in South Dakota was given to Dr. Theodore F. Riggs of Pierre.

TENNESSEE

Women Aid Children's Hospital.—A group of women from four counties in middle Tennessee, members of the Hospital Children's Aid League, are serving the Emerald-Hodgson Hospital in Sewanee, where last year 68% of the services extended to children were free. The Children's Aid League was formed in response to the need for furnishings for the linen closet for the children's wing then under construction. In a drive designed to raise $1,000, these women raised $4,500. This year's project was the Surprise Shop, at Winchester, where contributions ranging from frying pans to chandeliers were collected from here and there and sold to aid the Children's Fund. Officers of the League are Mrs. Kirby-Smith, Sewanee, chairman; Mrs. Blevins Rittenberry, Cowan, secretary, and Mrs. Bob Winton, Decherd, treasurer. The Emerald-Hodgson Hospital is located on property of the University of the South and is owned and operated by the university and the Episcopal Church.

TEXAS

State Medical Election.—At the annual meeting of the State Medical Association of Texas in Galveston, April 29-May 2, Dr. William M. Gambrell, Austin, was installed as president. Elected officers include Dr. Truman C. Terrell, Fort Worth, president-elect; Dr. Samuel N. Key, Austin, secretary, and Dr. Robert B. Homan Jr., El Paso, speaker of the house of delegates.

WEST VIRGINIA

Psychiatric Bulletin.—A new quarterly publication is being sponsored by the bureau of mental health of the state department of health. The publication, known as *The Psychiatric Bulletin,* will be circulated throughout the state to doctors, libraries, hospitals, industrial plants, and county and district health departments. The initial issue will be distributed in July.

WISCONSIN

Training for School Physicians.—During the week of June 11-15, Dr. Mary P. Warner, pediatric consultant of the Washington County Health Department, Maryland, held an in-staff training seminar for school physicians in Milwaukee at the invitation of the Milwaukee Health Department. Other participants in the seminar were Dr. Max E. Wiese, Milwaukee, Dr. Margaret E. Hatfield, Milwaukee, and Dr. Virginia S. Downes, Jackson, Miss. Discussions of school health programs lead by Dr. Warner were also held with the nursing staff and dental staff of the Milwaukee Health Department and with members of the Milwaukee School Board.

GENERAL

Society Election.—At its recent meeting the American Ophthalmological Society elected the following officers for 1951-52: Dr. Lawrence T. Post, St. Louis, president; Dr. Conrad Berens, New York, vice president; Dr. Maynard C. Wheeler, New York, secretary-treasurer, and Dr. Gordon M. Bruce, New York, editor.

Dr. Alvarez Awarded Medal.—Dr. Walter C. Alvarez, Chicago, recently was awarded the 1951 Friedenwald Medal, an award given annually to one of the senior members of the American Gastroenterological Association for outstanding work and distinguished service in the field of gastroenterology. The medal was presented to Dr. Alvarez at the annual scientific session of the association which was held in June in Atlantic City.

Dermatological Association Prizes.—In the annual essay contest sponsored by the American Dermatological Association to stimulate younger investigators to original work, Dr. Thomas B. Fitzpatrick, Rochester, Minn., won first place with his thesis, "The Tyrosinase Reaction as a Specific Index of Malignance of Pigment Cell Neoplasms, with Particular Reference to Malignant Melanoma." He presented his essay at the association meeting in Hot Springs, Va., in May and received a cash award of $300. Honorable mention was awarded to Dr. S. William Becker Jr., Rochester, Minn., for his paper on "The Dendritic Cell of the Epidermis" and to Dr. Joseph W. Goldzieher, New York, for his paper on "'Chemical' Analysis of the Intact Skin by Reflectance Spectrophotometry."

Outbreaks of Diphtheria.—The Maine Department of Health and Welfare reports an outbreak of 10 diphtheria cases in a state hospital. The first case was that of an attendant. Since May 6, two other attendants and seven patients have had diphtheria, with the outcome of one case (a patient aged 65) being fatal. Dr. Wilton L. Halverson, California State Department of Public Health, supplements a previous report of diphtheria in one of the northern counties. During May, 10 cases were reported. Two of the patients were nurses aides (aged 21 and 48 years) who had had contact with two diphtheria patients before the diagnosis of diphtheria was established. One patient was a hospital janitor (aged 69 years), and two others were ward patients (aged 82 and 86 years) in this hospital.

Dr. Edwin Jordan Appointed Executive Director.—The American Association of Medical Clinics has appointed Dr. Edwin P. Jordan as its executive director. Dr. Jordan was for several years previous to 1947 an associate editor of The Journal. From 1947 to 1950 he was director of education of the Frank E. Bunts Educational Institute and the Cleveland Clinic Foundation. Among his new duties will be the development of a program of graduate medical education in private medical clinics equipped for such activity. The American Association of Medical Clinics was formed in 1949 and recently had 62 member clinics representing about 1,500 physicians. Officers elected at the December meeting are Drs. Wallace M. Yater, Washington, D. C., president; Clair L. Stealy, San Diego, Calif., vice president, and Arthur H. Griep, Evansville, Ind., secretary-treasurer.

Death Rates Decline in Many Countries.—Extensive application of the recent advances in medicine has improved health conditions throughout the world, Metropolitan Life Insurance Company statisticians report. A comparison of death rates just before and after World War II shows that in each of 19 countries in both hemispheres the rate has declined by more than 8%, and in nine of these countries it has dropped 20% or more. In Japan the death rate fell by 30%, largely as the result of public health measures instituted by the American army of occupation. In Ceylon an anti-malaria campaign was an important factor in lowering the death rate during the postwar years, and in India the death rate has declined by about one fifth between the prewar and postwar years. Declines were also registered in Puerto Rico, Mexico, Costa Rica, Chile, and Venezuela. England and Wales experienced a mortality decline of 27%, and the United States a decline of 23%. Recent declines in mortality in the Western nations are credited in large measure to control of infectious diseases by means of chemotherapy and antibiotics.

Considers Health Program for Europe.—Guiding principles for international health programs directed in Europe by the World Health Organization were outlined by WHO's consultative committee for Europe at its first session in Geneva May 28-29. WHO's program on the continent is based on the principle that, in general, Europe is a developed area where health demonstration services are not so important as some other types of aid. For this reason the committee recommended that WHO stimulate health activities, coordinate health policies regarding problems shared by European countries, and exchange information and experience. Specific programs were recommended in the fields of housing, noninfectious chronic diseases of the adult population, dental hygiene, nutrition, regular health examination of the population, rehabilitation of tuberculous patients, and regional technical discussions. The committee recommended continuation of group projects as well as individual fellowships, especially in public health administration, mental hygiene, and other fields of major importance in Europe. Another session of the committee will be held at Geneva in the autumn to draft concrete proposals for the 1953 program.

Diabetes Victims Warned of Dangerous Remedy.—The known diabetics of the United States were warned July 5 that a diabetic remedy that is being mailed from Mexico is worthless and extremely dangerous if employed as a substitute for insulin. The U. S. Food and Drug Administration, with the cooperation of customs and postal authorities, has been able to prevent delivery of about 20 individual packages of the nostrum, which is advertised and labeled as "Cacalia Composita, Mexican Indian Root." It is being offered by the "Mexican Indian Root Co., Mexico City." Circulars give the name of "Dr. Miguel C. Martinez, general manager."

Advertisements for the remedy have been appearing in newspapers and magazines throughout the country. Cities where the advertisements are known to have been published are San Francisco, Sacramento, Cal., New York, Cincinnati, Detroit, Pittsburgh, Philadelphia, Uniontown, Pa., and Bridgeport, Conn. Direct mail advertising is also being used to promote the remedy. FDA officials said the mailings were heavy in the Vermont area, but the packages which were denied entry were addressed to all sections of the country. The remedy has been priced at $15 and $25, cash in advance.

Atlantic City Golf Awards.—Dr. Frank H. Lahey, Boston, assumed the presidency of the American Medical Golfing Association at the close of the recent Seaview Tournament in Atlantic City, N. J. Dr. Thomas A. Kyner, Kansas City, Mo., was chosen as the president-elect, Dr. Eugene P. Pendergrass, Philadelphia, first vice president, and Robert W. Elwell, Delanco, N. J., secretary-treasurer. The 36th annual meeting of the AMGA will be held in Chicago next June on the first Monday of the 1952 AMA annual meeting.

Dr. Vincent W. Guidice, Ridgewood, N. J., won the low gross championship for 18 holes and was presented the Golden State trophy. Dr. Harold T. Sargis, Cleveland, took the 36 hole gross title, winning the Will Walter trophy. Other trophy awards to the 264 medical golfers participating went to Dr. Gerald F. Dederick Jr., Oradell, N. J., the Detroit trophy as runner up for the 36 hole championship; Dr. Lewis R. Wolf, Philadelphia, the Ben Thomas trophy as the runner up in the 18 hole event; Dr. Edward J. Kempf, Wading River, N. Y., the St. Louis trophy for the best net 36 holes; and Dr. Gilbert M. Bayne, Glen Olden, Pa., the President's trophy for the best net score for the first flight of 18 holes. For the fifth time Dr. David H. Houston, Seattle, was the winner of the Wendell Phillips trophy for the best low net 18 holes among the past presidents of the AMGA.

CORRECTION

Course in Exfoliative Cytology (Cancer Detection).—The Office of the Dean of Cornell University Medical College, New York, points out that the postgraduate course, third from the top on page 584 of The Journal, June 9, 1951, should have been listed under "Malignant Disease" rather than under "Dermatology and Syphilology." This course will be repeated again beginning March 3, 1952.

Regulations for Diathermy Equipment.—In the item "Regulations for Diathermy Equipment" in The Journal June 2, 1951 (page 481), the channel frequency assignments were given as 13.66, 27.33, and 40.98 megacycles. These frequencies have been changed by the Federal Communications Commission to 13,560 kilocycles plus or minus 6.78 kilocycles; 27,120 kilocycles plus or minus 160 kilocycles, and 40,680 kilocycles plus or minus 20 kilocycles. From a therapeutic standpoint, these changes are of no consequence.

EXAMINATIONS AND LICENSURE

NATIONAL BOARD OF MEDICAL EXAMINERS

National Board of Medical Examiners: *Parts I and II.* Various Centers. Sept. 5-7 (Part I only). Applications must be filed at least thirty days prior to an examination. Ex. Sec., Mr. E. S. Elwood, 225 S. 15th Street, Philadelphia.

INTERNATIONAL COLLEGE OF SURGEONS

Examinations for Certified Fellowship in the United States Chapter in General and Orthopedic Surgery, Chicago, Aug. 3-4. Sec., Dr. Arnold S. Jackson, 1516 Lake Shore Drive, Chicago 10.

EXAMINING BOARDS IN SPECIALTIES

American Board of Anesthesiology: *Written.* July 20. Given simultaneously in several cities in the United States. Final date for filing application was Jan. 20. *Oral.* Memphis, Oct. 14-17. *Written.* July 18, 1952, Various locations. Final date for filing applications is Jan. 18, 1952. Sec., Dr. Curtiss B. Hickcox, 80 Seymour St., Hartford 15, Conn.

American Board of Internal Medicine: *Written.* Various centers, Oct. 15. Final date for filing applications was May 1. *Oral.* The schedule of oral examinations for 1951 has been arranged on a regional basis as follows: New York, date to be announced, covering Maine, Massachusetts, New Hampshire, New York and Vermont. San Francisco, date to be announced, covering Arizona, California, Colorado, Idaho, Montana, New Mexico, Oregon, Utah and Washington.
Only candidates who have not taken an oral examination can be admitted under the schedule arranged thus far.
Closing dates for the filing of applications for examinations in New York and San Francisco to be announced.
Oral examinations in the subspecialties will be held at the same time and place and on the same distribution.
Exec. Sec., Dr. William A. Werrell, 1 West Main Street, Madison 3.

American Board of Neurological Surgery: *Oral.* Chicago, Oct. 25-26. *Oral* Chicago, May 1952. Final date for filing applications for the May 1952 examination is Jan. 1, 1952. Sec., Dr. W. J. German, 789 Howard Ave., New Haven 4, Conn.

American Board of Obstetrics and Gynecology: *Written.* Feb. 1, 1952. Final date for filing applications is Nov. 1. *Oral.* Chicago, June 7-13, 1952. Final date for filing application is Feb. 1, 1952. Sec., Dr. Paul Titus, 1015 Highland Building, Pittsburgh 6, Pa.

American Board of Ophthalmology: *Written.* Twenty-five centers, Feb. 4-5, 1952. *Oral.* Chicago, October 8-13. Sec., Dr. Edwin B. Dunphy, 56 Ivie Road, Cape Cottage, Maine.

American Board of Orthopaedic Surgery: Final date for filing applications for the 1952 Part II examinations is Aug. 15, 1951. Sec., Dr. Harold A. Sofield, 122 S. Michigan Ave., Chicago 3.

American Board of Otolaryngology: *Oral.* Chicago, Oct. 8-12. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City.

American Board of Pediatrics: *Oral.* Buffalo, Oct. 26-28. Ex. Sec., Dr. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

American Board of Preventive Medicine: *Written.* San Francisco, October 28. *Oral.* San Francisco, October 29. Sec., Dr. Ernest L. Stebbins, 615 North Wolfe St., Baltimore 5.

American Board of Proctology: Philadelphia, Nov. 17-18. Sec.-Gen., Dr. Louis A. Buie, 102-110 Second Ave., S.W., Rochester, Minn.

American Board of Radiology: *Oral.* Washington, D. C., Sept. 17-22. Sec., Dr. B. R. Kirklin, 102-110 Second Ave., S.W., Rochester, Minn.

American Board of Surgery: *Written.* Various centers, Oct. 1951. Final date for filing applications is July 1. Sec., Dr. J. Stewart Rodman, 225 South 15th Street, Philadelphia.

Board of Throacic Surgery: *Written.* Various parts of the country. Sept. 14, 1951. Final date for filing applications is July 15. Sec., Dr. William M. Tuttle, 1151 Taylor Ave., Detroit 2, Mich.

American Board of Urology: Chicago, Feb. 9-13, 1952. Final date for filing applications is Sept. 1. Sec., Dr. Harry Culver, 314 Corn Exchange Bldg., Minneapolis 15.

MEETINGS

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, The Homestead, Hot Springs, Va., Sept. 6-8. Dr. William F. Mengert, 2211 Oak Lawn Ave., Dallas, Texas, Secretary.

American Congress of Physical Medicine, Shirley-Savoy Hotel, Denver, Sept. 4-8. Dr. Walter J. Zeiter, 2020 E. 93d St., Cleveland 6, Executive Director.

National Medical Association, Philadelphia, Aug. 20-24. Dr. John T. Givens, 1108 Church Street, Norfolk 10, Va., General Secretary.

Post Graduate Medical Assembly of South Texas, Shamrock Hotel, Houston, Texas, July 23-25. Mrs. W. H. Dahme, 229 Medical Arts Bldg., Houston, Executive Secretary.

Reno Surgical Society Conference, Riverside Hotel, Reno, Nev., Aug. 23-25. Dr. Olin C. Moulton, 130 N. Virginia St., Reno, Nev., Chairman.

Rocky Mountain Radiological Society, Denver, Aug. 9-11. Dr. Maurice D. Frazer, 1037 Stuart Building, Lincoln, Nebr., Secretary.

West Virginia State Medical Association, The Greenbrier, White Sulphur Springs, July 19-21. Mr. Charles Lively, 1031 Quarrier St., Charleston 24, Executive Secretary.

INTERNATIONAL

Association Internationale de Psychotechnique, Gothenburg, Sweden, July 24-28. Dr. Franziska Baumgarten-Tramer, Thunstrasse 35, Berne, Switzerland.

European Congress on Rheumatism, Barcelona, Spain, Sept. 24-27. Dr. Gunnar Edströn, Sweden, Secretary.

General Practitioners Study Club International, Rome, Italy, Sept. 12-15. Dr. John O'Connell, 10300 Lackland Road, St. Louis 14, Mo., U. S. A., President.

International Anesthesia Research Society, London, England, Sept. 3-7. Mr. R. W. Cope, University College Hospital, London W.C.1, England.

International Association of Allergists, Zurich, Switzerland, Sept. 23-29. Prof. A. S. Grumbach, Hygiene Institut der Universitaet Zurich, Gloriastr. 32, Zurich, Switzerland.

International Congress of Anesthesiology, Nursing School of the Salpiettre, 47 Boul de l'Hospital, Paris, France, Sept 20-22. 12 rue de Seine, Paris 6ᵉ, France, Secretariat.

International Congress of Clinical Pathology, London, England, July 16-20. Dr. W. H. McMenemey, Maida Vale Hospital for Nervous Diseases, London W.9, England, Secretary.

International Congress on Industrial Medicine, Instituto Superior Técnico, Lisbon, Portugal, Sept. 9-15. Dr. Luis Guerreiro, Instituto Nacional do Trabalho e Previdência, Praça do Comercio, Lisbon, Secretary General.

International Congress on Mental Health, Mexico City, Mexico, Dec. 11-19. Mrs. Grace E. O'Neill, Division of World Affairs, National Association on Mental Health, 1790 Broadway, New York 19, N. Y.

International Congress of Physical Medicine, London, England, July 14-19. Dr. A. C. Boyle, 45, Lincoln's Inn Fields, London, W.C.2, England, Honorary Secretary.

International Congress of Psychology, Stockholm, Sweden, July 16-21. Secretariat: Psychological Institute, Observotoriegatan 8, Stockholm, Sweden.

International Gerontological Congress, Hotel Jefferson, St. Louis, Mo., U. S. A., Sept. 9-14. Dr. John E. Kirk, 5600 Arsenal Street, St. Louis 9, Mo., Chairman, Program Committee.

International Hospital Congress, Brussels, Belgium, July 15-21. Capt. J. E. Stone, 10 Old Jewry, London E.C., England, Secretary.

International Poliomyelitis Congress, Copenhagen, Denmark, Sept. 3-7. Prof. Dr. Niels Bohr, Statens Seruminstitut, 80 Amager Blvd., Copenhagen S., Denmark, President.

International Society of Surgery, Paris, France, Sept. 24-29. Dr. L. Dejardin, 141, rue Belliard, Brussels, Belgium, Secretary General.

International Society for the Welfare of Cripples, Fifth World Congress, Stockholm, Sweden, Sept. 9-14. Mr. Donald V. Wilson, 54 E. 64th St., New York 21, N. Y., U. S. A., Executive Director.

Pan American Congress on Tuberculosis, Guayaquil and Quito, Ecuador, S. A., July 14-22. Dr. Marco Martinez M., Casilla de Correos No. 116, Guayaquil, Ecuador, Secretary General.

Pan Pacific Surgical Association Congress, Honolulu, Hawaii, Nov. 7-19. Dr. Forrest J. Pinkerton, Suite 7, Young Bldg., Honolulu, Hawaii, President.

Students' International Clinical Congress, Leyden, Utrecht, Groningen and Amsterdam, Holland, July 10-28. N. A. M. Bergstein, Oude Gracht 143 bis, Utrecht, Holland, Secretary General.

World Confederation for Physical Therapy, Copenhagen, Denmark, Sept. 7-8.

World Medical Association, Stockholm, Sweden, Sept. 15-21. Dr. Louis H. Bauer, 2 E. 103d St., New York 29, N. Y., U. S. A., Secretary-General.

DEATHS

Hektoen, Ludvig ⊕ internationally known pathologist and 1942 recipient of the Distinguished Service Medal of the American Medical Association, died at Michael Reese Hospital, Chicago, July 5, aged 88, of diabetes. Dr. Hektoen was born in Westby, Wis., July 2, 1863. He studied at Luther College, Decorah, Iowa, and at the University of Wisconsin. His medical career began with a job as druggist in a hospital, which became for him an inspiration to the study of medicine. He graduated in 1887 from the College of Physicians and Surgeons in Chicago, then served as apothecary in the Illinois Eastern Hospital for the Insane and subsequently made first place in the examination for internship at the Cook County Hospital. Here he came under the direct instruction of Christian Fenger. Dr. Hektoen served at Cook County Hospital from 1889 to 1903, as lecturer in pathology at Rush Medical College, 1890-1892, and for a period in the interim as curator of the museum, physician to the coroner's office in Chicago, 1890-1894, and as professor of pathology at the College of Physicians and Surgeons, 1892-1894. Returning to Rush Medical College as professor of morbid anatomy in 1895, he became professor of pathology in 1898, holding this title until 1933, when he became professor emeritus. He was professor and head of the department of pathology at the University of Chicago from 1901 to 1932.

Ludvig Hektoen, M.D.
1863-1951

Throughout his long career Dr. Hektoen was a member of innumerable scientific societies in this country and abroad, having spent several of his early years in postgraduate study in Upsala, Prague, and Berlin. He served as president of the Chicago Medical Society, 1919-1921; the Chicago Pathological Society, 1898-1902; the Association of American Pathologists and Bacteriologists, 1901; Society of American Bacteriologists, 1929, and the Society of Immunologists in 1927. Dr. Hektoen was a founder of the Institute of Medicine of Chicago (1915) and had been from the first active on its board of governors, serving as chairman from 1921 to 1940, when he was chosen honorary chairman. He was president of the institute in 1929. He was vice president of the American Association for the Advancement of Science in 1909 and of the Chicago Academy of Criminology in 1931. He served as chairman of the Division of Medical Sciences of the National Research Council for a year beginning in 1924, again for a year in 1926 and again in 1929. From 1936 to 1938 he was chairman of the National Research Council and from 1934 to 1938 a member of the National Advisory Health Council of the U. S. Public Health Service. At one time he was also a member of the board of trustees of Science Service, representing the National Research Council, and a member of the board of trustees of the American Documentation Institute.

Dr. Hektoen served the American Medical Association as chairman of the Provisional Section on Pathology, 1899-1900, chairman of the Section on Pathology and Bacteriology, 1900-1901, was a member of the House of Delegates in 1918 and 1920, and for many years was chairman of the Committee on Scientific Research, in which position he was instrumental in determining the distribution of grants for research.

Throughout much of his life Dr. Hektoen was engaged in the field of cancer, serving for many years as a member of the board of directors of the American Society for the Control of Cancer and from 1937 to 1944 as executive director of the National Advisory Cancer Council of the U. S. Public Health Service. In 1930 Dr. Hektoen was chosen chairman of the Cancer Research Institute of Chicago, which had been incorporated by the Chicago Woman's Club in 1929, and in 1941 he was named to a similar position for the Chicago Cancer Committee, which was organized as a liaison educational agency. He was one of the founders of the Chicago Tumor Institute and was president of its board of trustees until May, 1951, when he became president emeritus.

His literary contributions have shown an interest in many phases of medical science and his writings have been voluminous. He was editor of *The Journal of Infectious Diseases* from 1904, when it was first established, until 1941. The *Archives of Pathology*, of which he had been editor since its first appearance in 1926, dedicated its July 1938 issue to Dr. Hektoen in commemoration of his 75th birthday. He was at various times editor of the *Proceedings of the Institute of Medicine of Chicago* and of the *Transactions of the Chicago Pathological Society*. His published works include "The Technique of Post-Mortem Examination" and "Introduction to Study of Infectious Diseases." Notable scientific contributions first described by Dr. Hektoen include the term Hektoen's phenomenon: "When antigens are introduced into the animal body in allergic states, there may exist an increased range of new antibody production which may include production of antibodies concerned in previous infections and immunizations."

Dr. Hektoen had given many outstanding lectures, including the Pasteur, the Cutter, and the Fenger lectures. In recognition of his brilliant career as scientist, he was awarded in 1942 the Distinguished Service Medal of the American Medical Association. The previous year he had been accorded the centennial award of the Wisconsin State Medical Society for distinguished service and in 1929 the Order of St. Olaf from the Norwegian government. On July 2, 1943, the John McCormick Institute for Infectious Diseases, of which he had been a founder and director from 1902 to 1940, was rededicated in his honor as the Ludvig Hektoen Institute for Medical Research of Cook County. The occasion marked the 80th birthday of Dr. Hektoen and commemorated his many notable achievements in the fields of pathology, bacteriology, and immunology. Dr. Hektoen's ability as a student and scientist was further recognized in honorary degrees from Rush Medical College, the University of Norway, the University of Michigan, University of Wisconsin, University of Cincinnati, Western Reserve University, and the University of Chicago. In his death, the profession of medicine has lost a truly great physician, and our country, a truly great citizen.

⊕ Indicates Fellow of the American Medical Association.

Titus, Paul ⊕ for many years secretary-treasurer and director of the American Board of Obstetrics and Gynecology, died suddenly at his home in Pittsburgh June 28, aged 66, of coronary thrombosis. Dr. Titus was born in Batavia, N. Y., May 6, 1885. Following graduation from Yale University School of Medicine in New Haven, Conn., in 1908, he went to Heidelberg, Germany, where he became an assistant at the Universitäts Frauenklink, serving until 1910. Returning to this country, he served as an assistant in obstetrics at Johns Hopkins Hospital in Baltimore from 1910 to 1911, then became a resident obstetrician and gynecologist at the Elizabeth Steel Magee Hospital. He was affiliated at various times with the St. Margaret Memorial Hospital, Pittsburgh Hospital, Western Pennsylvania Hospital, and Shadyside Hospital in Pittsburgh and the Homestead Hospital in Homestead, Pa. He was secretary-treasurer of the Advisory Board for Medical Specialists from its inception in 1933 until 1941, vice president from 1943 to 1945, and president from 1945 to 1947. In 1933-1934 Dr. Titus served as vice chairman of the Section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association. Through his activities on the Post Graduate Survey Committee of the American Board of Obstetrics and Gynecology, he worked with the Council on Medical Education and Hospitals of the American Medical Association on approval of residency programs. He was president of the Association of Yale Alumni in Medicine in 1942-1943, and of the Pittsburgh Academy of Medicine in 1929-1930. Long active in the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Dr. Titus had been a member of its executive council from 1929 to 1935 and from 1939 to 1945, and served as president in 1937-1938. He was a member of the American Gynecological Society, serving as vice president in 1948-1949, and the Society Royale, Belge de Gynecologie et d'Obstétrique, and a fellow of the American College of Surgeons. In 1937 he was decorated by the Hungarian government with the Commander Cross of the Hungarian Order of Merit in recognition of his work in obstetrics. From 1915 to 1919 he was a civilian aide to the Military Special Agent for Naval Intelligence and in 1943-1944 was a consultant to the surgeon general of the United States Army. He entered the service July 22, 1944 as a lieutenant commander and later was promoted to Captain in the Naval Reserve and assigned to the Professional Division of the Bureau of Medicine and Surgery in Washington, D. C., until 1946. He was awarded the Navy Commendation Ribbon in 1945 and commended by Secretary of the Navy James Forrestal "for distinctive service in establishing a professional standard for intern and residency training in naval hospitals," and "for his cooperative efforts toward the establishment and professional classification of reserve medical officers and the procurement of important data." Since 1946 he had been a reserve consultant to the advisory board of the Bureau of Medicine of the Navy Department, and since 1948 a member of the Armed Forces Medical Advisory Committee. Dr. Titus was directing editor of the "Directory of Medical Specialists" from 1937 to 1947, and at the time of his death he was a member of the advisory editorial board of the *American Journal of Obstetrics and Gynecology*. He was the author of "Management of Obstetric Difficulties," 1937, second edition in 1940, third edition in 1945; "Diseases of Women for the General Practitioner," 1937, and "Atlas of Obstetric Technic," 1943, second edition in 1949.

Price, George Elmer ⊕ Seattle; born in Bridgeport, Pa., Feb. 10, 1874; University of Pennsylvania Department of Medicine, Philadelphia, 1898; specialist certified by the American Board of Psychiatry and Neurology; member of the American Medical Association, American Neurological Association, and the North Pacific Society of Internal Medicine; at one time practiced in Philadelphia, where he had been on the faculty of Jefferson Medical College and affiliated with Philadelphia General and Jefferson Medical College hospitals; consultant in neuropsychiatry at the U. S. Marine Hospital; served during World War I; died in Seattle General Hospital April 24, aged 77, of bronchopneumonia and carcinoma of the stomach.

Miller, Raymond Eugene, Clarkston, Mich.; Detroit Homeopathic College, 1904; died Feb. 1, aged 71, of coronary thrombosis and chronic nephritis.

Nelken, Bernard Earl ⊕ Baton Rouge, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1924; specialist certified by the American Board of Internal Medicine; served during World War II; secretary of the East Baton Rouge Parish Medical Society; affiliated with Baton Rouge General Hospital and Our Lady of the Lake Sanitarium; died Feb. 9, aged 53, of coronary thrombosis.

Riley, Josephine, Chillicothe, Ohio; National University Medical Department, Washington, D. C., 1901; died in Chillicothe Hospital April 11, aged 88, of fracture of the left hip and arteriosclerosis.

Roberson, Arthur William, Chicago; Meharry Medical College, Nashville, Tenn., 1919; died April 25, aged 56, of concussion of the brain resulting from a fall.

Robinson, William Arthur, Ocean Grove, N. J.; Jefferson Medical College of Philadelphia, 1905; member of the American Medical Association; on the staff of the Monmouth Memorial Hospital in Long Branch and Fitkin Memorial Hospital in Neptune, where he died April 26, aged 69, of carcinoma of the pancreas.

Ryley, Harold William, East Rutherford, N. J.; Harvard Medical School, Boston, 1922; school physician; member of the American Medical Association; on the staff of the Hackensack (N. J.) Hospital, where he died April 19, aged 57.

Sanger, Fenton Mercer ⊕ Oklahoma City, Okla.; Epworth College of Medicine, Oklahoma City, 1907; member of the American Medical Association; served during World War I; died in April, aged 83, of coronary occlusion and arteriosclerosis.

Schnitter, Charles Henry, Grand Island, N. Y.; University of Buffalo School of Medicine, 1934; member of the American Medical Association; school physician; served on the staff of the Millard Fillmore Hospital in Buffalo; died April 25, aged 42, of congestive heart failure.

Seaman, James Alpheus ⊕ Springfield, Mass.; Columbia University College of Physicians and Surgeons, New York, 1919; specialist certified by the American Board of Urology; member of the American Urological Association; fellow of the American College of Surgeons; for many years secretary of the Springfield Academy of Medicine; on the staff of the Westfield (Mass.) State Sanatorium, Springfield Hospital, Holyoke (Mass.) Hospital, and Shriners Hospital for Crippled Children; died in Springfield Hospital April 21, aged 61, of cerebral hemorrhage.

Thompson, William C. ⊕ Westerly, R. I.; New York Homeopathic Medical College and Hospital, New York, 1903; member of the staff of Westerly Hospital; consultant on the staff of South County Hospital in Wakefield; died March 18, aged 74, of aortic stenosis and pulmonary infarct.

Thomson, Alexander ⊕ Detroit; Detroit College of Medicine, 1894; died April 2, aged 82, of acute coronary thrombosis.

Utter, John Charles, Mount Carmel, Ill.; Miami Medical College, Cincinnati, 1880; died April 15, aged 91, of injuries received in a fall.

Van Doren, William ⊕ Mechanicville, N. Y.; Albany (N. Y.) Medical College, 1889; an Associate Fellow of the American Medical Association; past president of the school board; died April 21, aged 85.

Van Vranken, Albert Bensen ⊕ Skaneateles, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1900; formerly practiced in Schenectady, where he was on the staff of Ellis Hospital; died April 29, aged 77, of carcinoma.

Wallace, Harry Clay, Mount Healthy, Ohio; Medical College of Ohio, Cincinnati, 1900; died in Cincinnati April 17, aged 81, of cardiorenal disease.

Wilkin, W. Ernest ⊕ South Whitley, Ind.; Barnes Medical College, St. Louis, 1904; served on the staff of Lutheran Hospital in Fort Wayne; died April 16, aged 70, of cerebral hemorrhage.

Williams, Rodney Ralph ⊕ Dobbs Ferry, N. Y.; Cornell University Medical College, New York, 1908; member of the American Psychiatric Association; affiliated with the Children's Village; at one time on the staffs of the Binghamton (N. Y.) State Hospital and the Hudson River State Hospital in Poughkeepsie; served as consulting psychiatrist to the Westchester County Children's Court; died April 14, aged 68, of heart disease.

GOVERNMENT SERVICES

ARMY

Civilian Medical Care for Army Personnel.—The following statement, slightly abbreviated here, was submitted by the Surgeon General's office:

Adequate and timely medical care and treatment, including hospitalization, is provided for Army personnel in the United States generally by dispensaries, infirmaries, and hospitals located at the many Army installations throughout the country. However, there are many locations where Army or other United States federal medical treatment facilities are not available when medical service is required by Army personnel. In cases of this nature the services of civilian physicians, clinics, and hospitals are necessary. Certain criteria, in accord with current laws and regulations, define the conditions under which individuals of the Army may be authorized civilian medical care (other than elective) at the expense of the Army. Such care is authorized for commissioned officers, contract surgeons when employed by the Army on a full-time basis, warrant officers, enlisted personnel, cadets of the United States Military Academy, general prisoners, and prisoners of war, when these personnel are on a duty status or when they are absent from their place of duty, on leave or informal leave (pass) status. Applicants for enlistment in the Army and selectees also are authorized necessary civilian medical care at the expense of Army funds while they are being processed for enlistment or induction into the Army. Payment for civilian medical expenses incurred by Army personnel who are absent without leave is not authorized. Any obligations resulting from civilian medical care to Army personnel who are absent without leave are the responsibility of the Army individual concerned.

Normally, civilian medical care for Army personnel is authorized only when there are no other federal medical treatment facilities available. First aid or emergency treatment is authorized at any time, notwithstanding the proximity of Army or other federal medical treatment facilities. Emergency medical care may be defined as that required to save life, limb, or prevent great suffering. Surgical operations should not be performed without prior approval of military authorities, unless indicated as an emergency procedure. Elective medical treatment in civilian medical treatment facilities or by civilian physicians will not be authorized, as Army funds cannot be used for payment of these services.

Due to limitation of funds available, medical care of dependents of military personnel from civilian sources, at Army expense, is not authorized. Dependents of military personnel may obtain available medical care at Department of Defense medical facilities only. Any obligations resulting from civilian medical care to dependents of military personnel are the responsibility of the dependents concerned or their sponsors.

As a general rule, the local military commander will furnish the civilian medical agency with prior written authority for ordinary medical care to Army personnel under his jurisdiction. In such cases prior arrangements with the civilian medical agency will be made by the individual or by a proper military authority. For emergency patients treated without prior written authorization the surgeon of the nearest military command should immediately be notified by the civilian medical agency, giving the individual's name, organization, nature of illness or injury, and statement of the practicability of transfer of the patient to an Army or other governmental hospital. The civilian agency or physician then will be advised without delay by the appropriate military authorities as to procedures to be followed.

Bills for authorized medical care and treatment of Army personnel should be submitted to the commanding officer of the organization to which the patient belongs, or to the military authority who provided the authorization for the medical service. If the location of these individuals is not readily known or if such military commanders authorizing treatment have moved to another station, bills for medical services rendered should be submitted to the military authorities listed below according to states.

For Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont submit bills to the Surgeon, First Army, Governors Island, New York.

For Delaware, Kentucky, Maryland, Ohio, Pennsylvania, Virgina, and West Virginia submit bills to the Surgeon, Second Army, Fort George G. Meade, Md.

For Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, and Tennessee submit bills to the Surgeon, Third Army, Fort McPherson, Ga.

For Arkansas, Louisiana, New Mexico, Oklahoma, and Texas submit bills to the Surgeon, Fourth Army, Fort Sam Houston, Texas.

For Colorado, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Wisconsin, and Wyoming submit bills to the Surgeon, Fifth Army, 1660 E. Hyde Park Blvd., Chicago 15, Ill.

For Arizona, California, Idaho, Montana, Nevada, Oregon, Utah, and Washington submit bills to the Surgeon, Sixth Army, Presidio of San Francisco, Calif.

For Washington, D. C., submit bills to the Surgeon, Military District of Washington, Washington 25, D. C.

The bill should show the full name, rank, and service number of the patient, place, and inclusive dates of treatment, diagnosis, and charges, all itemized separately. The duty status of the patient at the time of illness or injury also should be shown, such as duty, leave, or pass. Payment will be expedited if the following certificate is typed on the bill and signed:

> "I certify that the above charges are correct and just; that payment therefor has not been received; that the services were necessary in the care and treatment of the person named above; that the services were rendered as stated; and that the charges do not exceed those customarily charged in this vicinity."

______________________ (Signature of Payee)

______________________ (Title or Capacity)

Further information concerning this matter may be requested of the military surgeons at the above addresses or from the Surgeon General, Department of the Army, Washington 25, D. C. Any difficulties experienced should be called to the attention of these Army authorities in order that this program may render the American soldier the prompt and adequate care and treatment to which he is entitled.

DEPARTMENT OF DEFENSE

Dr. Lovelace to Head Medical Policy Council.—Appointment of Dr. W. Randolph Lovelace II as chairman of the Armed Forces Medical Policy Council, effective July 1, was announced May 8 by George C. Marshall, secretary of defense. Dr. Lovelace succeeds Dr. Richard L. Meiling, whose resignation becomes effective June 30. Dr. Lovelace resides in Albuquerque, N. M., where he is head of the section on surgery and a member of the board of governors of Lovelace Clinic. During World War II he served with the Army Air Force, advancing from the rank of major to that of colonel. He was awarded the Distinguished Flying Cross, the Air Medal and three combat stars, the Legion of Merit, and the Army Commendation Ribbon. In 1945 he was presented the Royal Order of the Sword by the king of Sweden.

He has served as surgical consultant for a number of hospitals and two commercial airlines and was appointed a member of the Armed Forces Medical Policy Council when it was established on January 2, 1951. He received an A.B. degree from Washington University, St. Louis, in 1930; an M.D. at Harvard University in 1934; an M.S. in surgery at the University of Minnesota in 1939, and later was graduated from the School of Aviation Medicine, Randolph Field, Tex.

Dr. Lovelace is a diplomate of the American Board of Surgery, a fellow of the American Medical Association, the Institute of Aeronautical Sciences, and the Aero Medical Association, is affiliated with the University of Colorado Medical School as a lecturer in physiology, has contributed numerous papers to medical journals, and was co-winner of the Collier Trophy Award in 1940.

FOREIGN LETTERS

BELGIUM

International Congress on Hospitals.—The Seventh International Congress on Hospitals will be held in Brussels July 15-21, 1951, under the chairmanship of René-Sand. The Congress on Hospitals, the last of which was held in Groningen in 1949, is usually attended by hundreds of directors of public services, men and women active in charities, directors of hospitals, physicians, nurses, social workers, architects, engineers, and technicians. The congress will be devoted especially to hospital problems concerning chronically ill patients and old people. The congress will state its principles and define the outlines of its work. A joint report will be presented at the opening session by Dr. E. M. Bluestone, former director of the Montefiore Hospital in New York, and by Dr. Pierre Delore, professor, Faculty of Médicine, Lyon. The four study sessions will be held simultaneously; problems concerning chronic disease will be discussed.

Infant Mortality in Belgium.—Professor Garot of the University of Liège published in *Bruxelles-Médical* an article on work done to decrease the infant death rate. Infant mortality has greatly decreased in Belgium. From 1935 to 1939, the recorded death rate was between 7.85 and 7.25%; the rate decreased to 5.03% in 1948 and to 4.77% in 1949. This reduction reclassifies Belgium as a country with a low infant death rate. However, the leading countries are still far in advance of Belgium; the rate in Holland in 1948, for example, was only 2.8%. Of a total infant death rate of 6.67%, calculated in relation to the living newborn infants, the death rate was 2.64% the first month and 4.03% during the following 11 months. Consequently, neonatal mortality represents 39.6% of the total infant mortality. Deaths occurring between 1 and 6 months of age represent 45.6% of the mortality for the first year, while mortality between 6 and 12 months is only 14.8% of the total.

In order of importance, the causes of death are listed as follows: (1) premature birth and congenital debility (35.14%), (2) diseases of the respiratory apparatus (17.20%), (3) specific acute and chronic infections (13.08%), (4) diseases of the digestive tract (10.60%), and (5) miscellaneous causes (23.59%). Most unavoidable deaths occur in the first days or weeks of life and are mainly due to trauma and malformation. There is a high incidence of death due to premature birth or congenital debility during the first month. Death from respiratory disease reaches a clearly defined peak between 3 and 9 months of age, in which period one-third of the total deaths occur. Death by specific infection follows an increasing curve with age, but there is an increased incidence after the age of 7 months.

The influence of seasons is definite. Between 1 and 12 months of age, infant mortality reaches a maximum during the first three months of the year and drops to a minimum during the third quarter of the year. The highest incidence of respiratory diseases occurs in the first quarter and the lowest incidence in the third quarter of the year. The peak of specific infections is reached during the first quarter of the year. The lowest incidence of digestive diseases is recorded during the first quarter and the highest during the third quarter of the year.

Fetal anoxia is an important cause of neonatal mortality. Experience has proved, in fact, that it is the diminished oxygen supply to the fetus that most frequently causes accidents leading to stillbirth and to neonatal mortality. Anoxia is a main factor or an aggravating factor in about 50% of the cases of early death. The author concludes that, under the present circumstances, it is not possible to hope to reduce in the coming years to less than 1.5% the mortality of infants between the ages of 1 and 12 months.

Medical Examination of Students.—The free University of Brussels has created a service of preventive medicine, and *Bruxelles-Médical* has just published the first results of their activities during 1949-1950. During the year, 3,821 young persons have been screened by roentgenography, among whom 63 (1.3%) underwent a more thorough examination. Forty-three of the latter group (1.1%) were re-examined, and 5 (0.3%) were found to have an active tuberculous process. This proportion agrees with those reported by other universities. The results of these examinations stress the significance of preventive medical examination. In general it calls the students' attention to weak points in their health. In some particular cases, which were fortunately limited, it has permitted the early recognition and prompt treatment of students with tuberculous lesions.

Cancer of the Heart.—A report of a rare condition was presented at the Belgian Society of Cardiology by Courtoy and Potvliege. An elderly woman showed cardiac decompensation (of right ventricular type). Necropsy disclosed a large heart (825 gm.) a blood-stained pericardiac effusion, and a tumor almost completely destroying the right ventricle. Microscopic examination revealed the reticulosarcomatous nature of the tumor. There was no bundle branch block demonstrated by the electrocardiogram, despite tumor involvement of the terminal portion of the right division of the bundle of His.

Campaign Against Sleeping Sickness in the Belgian Congo.—An important contribution to the fight against sleeping sickness is presented in the recent report of the Central Committee for Medical Services of the Colony. Excellent results were obtained during the last year through the institution of prophylactic treatment with pentamidine® (4,4-[pentamethylenedioxy] dibenzamidine). In 1950, new cases of trypanosomiasis registered totaled 7,609, compared with 9,873 in 1949 and 11,080 at the end of World War II.

ITALY

Chronic Laryngitis.—Prof. Ernesto Pallestrini, recently appointed director of the otorhinolaryngological clinic of the University of Genoa, lectured on chronic laryngitis. Functional laryngeal changes occur during treatment with estrogenic substances. Allergic manifestations, such as the edema of the laryngeal tissues and of the glottis with dysphonia and dyspnea, are now better recognized. Some pathological conditions of the laryngeal mucosa attributed in the past to neuroarthritism and to hormone dysfunction are now known to be due to vitamin deficiencies. Endocrinology has contributed important information on, for example, the interrelation of the larynx and the adrenals and of the sex hormone dysfunctions that cause laryngeal dysfunctions.

According to the speaker constitutional conditions are of fundamental importance in maintaining or aggravating, but never determining, laryngitis. In catarrhal laryngitis, clinical observation aids in establishing the presence and the prevalence of epithelial injuries, injuries of the connective tissue, muscular lesions, and nervous lesions. The predominance of one of these over the others determines the particular clinical form. Among all these, the best known are the epithelial lesions, because they do not present difficulty in visualization; however, on microscopic examination, one becomes convinced that there are also important alterations of the underlying connective tissue. With respect to laryngeal cancer, Professor Pallestrini believes that inflammation of the laryngeal mesenchymatous tissue can constitute a precancerous condition.

The items in these letters are contributed by regular correspondents in the various foreign countries.

Electrochemography of the Heart.—At a meeting of the medical academy Filippo Pacini in Pistoia, Professor Pozzi discussed electrochemocardiographic equipment, consisting of the roentgenologic apparatus, the photoelectric cell with electronic multiplication, the fluorograph, and the electrocardiograph. The speaker supported Professor Luisada's concept that a phonocardiograph, instead of the carotid or the jugular pulse, may be used for timing. He explained the fundamental principle on which electrochemography is based, the different physiological phases that occur, the significance of the tracings, and the principles to be followed in reading them.

An experimental session followed in the roentgenologic laboratory, and the speaker, in cooperation with Professor Romagnoli, demonstrated the procedure of mounting the photocell. Comparing a series of tracings obtained according to the methods of Lianminot and Luisada with the tracings obtained with the most modern electrochemograph, Professor Pozzi showed how the three types of tracings (venoatrial, ventricular, and arterial), although identical in fundamental characteristics, have been enriched in details.

International Radiomedical Center.—Prof. Guido Guida, President of the International Radiomedical Center, discussed the aid given by the center during the year 1950 to seamen aboard Italian and foreign ships in the Mediterranean Sea. The center has established a short-wave radio, which operates 24 hours a day, with broadcasts at fixed hours. It has also organized a course of elementary radio medicine for captains of ships. The center broadcasts a medical program dealing with subjects of interest to the seamen, especially with the problem of nutrition and of human pathology in the tropics. At present it is studying the possibility of extending the radio medical assistance to passengers of long-distance air lines. Sixteen surgical and 198 medical patients were treated during the year 1950.

BRAZIL

Acute Appendicitis in Children.—Dr. Primo Curti, of Hospital das Clinicas, São Paulo, reported the analysis of 91 cases of acute appendicitis in children under 12 years. The diagnosis was confirmed in all cases by examination of the appendix and the peritoneum. The author's cases were compared with the well-known cases of Hudson and Chamberlain, Scott and Ware, Stone, and Boyce, in the American medical literature. The 91 cases were divided as follows: catarrhal 26 (28.6%), fibrinous 9 (9.9%), gangrenous 10 (11.0%), hyperplastic 7 (7.6%), suppurated 13 (14.3%), and perforated 26 (28.6%). The last two types, which comprise the severer forms, represent 42.9% of the total, which does not differ significantly from the figures for the American authors (Hudson and Chamberlain, 44%; Scott and Ware, 44.4%; Stone, 44.9%, and Boyce 37.2%). The same may be said about the sex distribution, as the percentage of male patients is practically the same for all the series of patients (Curti, 54%; Scott and Ware, 59%; Stone, 55%, and Hudson and Chamberlain, 34%). The duration of hospitalization averaged 5.3 days in the simple, catarrhal cases, as against an average of 11.7 days for the remaining cases.

Pulmonary Lesions in South American Blastomycosis.—Pulmonary lesions are now known to be relatively frequent in South American blastomycosis, contrary to reports of earlier authors who studied the disease without the help of routine x-ray examinations and autopsy of the lungs. A. Fialho, in his pathological study of the pulmonary involvement of the disease, published in 1946, stressed the paucity of symptoms and the absence of pain, dyspnea, hemoptysis and high fever, pointing out that a slight cough and low fever are in general the only clinical symptoms of such localization. In a recent study of South American blastomycosis, Carlos S. Lacaz, of the department of microbiology and immunology of São Paulo University, reports the result of x-ray and sputum examinations in 35 cases with the discovery of pulmonary involvement in 20 (57.1%). An important point was particularly studied by Lacaz: Does spontaneous regression of a blastomycotic pulmonary focus occur? In 1946, A. Fialho presented pathological proof of spontaneous remission, such as that which occurs in other pulmonary mycoses, particularly coccidioidal granulomatosis. It is known that in some fungous infections endemic in some sections of the United States, most humans can spontaneously overcome the infection. In such instances, the patients are sensitive for a long period to products of fungi known as coccidioidin and histoplasmin and respond positively to cutaneous tests with these substances. With respect to South American blastomycosis, it has never been proved that a subject with a positive reaction to paracoccidioidin has had a "slight pulmonary infection" without having the "disease." The slight pulmonary lesions—a kind of primary blastomycotic complex—might be calcified, regress, or become generalized. Lacaz, in a preliminary survey of 330 patients, gave intradermal injections of paracoccidioidin in a Smith medium and obtained 26 positive results (7.8%). Results of radiologic examination of the lungs of these patients were normal, and Paracoccidioides brasiliensis was not found. A new series of tests is being performed with diluted paracoccidiodin, in order to eliminate false positive reactions and cross reactions with another mycosis.

Death of Dr. G. Paula Souza.—Dr. Geraldo Paula Souza, dean of the school of hygiene and public health, São Paulo University, and permanent delegate of Brazil to the World Health Organization, died recently, at the age of 62. He studied medicine in Switzerland and Germany and public health at Johns Hopkins University, and commenced his teaching career as assistant to Dr. Darling, who was, from 1918 to 1922, professor of hygiene at São Paulo University. From 1922 to 1927, Dr. Paula Souza was director of the São Paulo state department of health, where he introduced modern methods of public health administration. He was the founder of the São Paulo Institute of Hygiene, which a few years ago was transformed in a School of Hygiene and Public Health with the cooperation of the Rockefeller Foundation. In 1945, Dr. Paula Souza, one of the members of the Brazilian delegation to the San Francisco conference, was the most ardent advocate of the creation of the World Health Organization, and was the author of the proposal to include the "right to health" in the United Nations charter. His death is a loss particularly to the public health field in Brazil.

ECUADOR

Yellow Fever.—Yellow fever disappeared from Ecuador for many years after the campaign against the disease, which was carried on under the direction of Dr. Noguchi, several years ago. Recently the disease reappeared in a municipality 100 km. from Esmeraldas City, in the mountains in the northeast part of the country. About 50 cases of the disease, identified as the jungle form of yellow fever, occurred. A campaign of vaccination against yellow fever was successfully completed. The authorities state the danger is now over.

Maternity Hospital in Quito.—The Isidro Ayora maternity hospital was opened on May 26. It is named for the greatest obstetrician of Ecuador. The hospital, the construction and equipment of which are very much up-to-date, occupies a total area of 7,344 square meters, with a capacity of 210 beds and a space of 40 square meters per bed. It was equipped by donations from the United States of America and the United Nations. The new maternity will function the first year on a budget of 1,906,000 sucres under the direction of an administrative council made up of representatives of the Ministry of Public Aid and Social Assistance and of the Cooperative Service of North America. Dr. César Jácome, head of the old maternity hospital and director of the school of obstetrics of Central University, was appointed director. The president of the republic, the authorities of the state, and the members of the Cooperative Service of North America were present at the opening ceremonies held in May, during which Dr. Maurice Pate, executive director of the UNICEF, received a medal for services given to Ecuador.

CORRESPONDENCE

THE GENERAL PRACTITIONER

To the Editor:—I agree with the statement by Dr. Edward P. Lehman in the May 19 issue of The Journal that the closed staff of the hospital definitely resulted in an improved quality of surgical performance and there is no reason why those procedures requiring a definite and acquired amount of skill should be open to an ill-trained man. Unfortunately, this closing of hospitals did not stop at surgery. It has gradually increased to such an extent that only board men in some larger cities have access to the staff of hospitals, and in many hospitals, if an individual has maternity privileges, he is not permitted to bring his medical cases in. If he has pediatric privileges, he may not bring his gynecological patients in. So, far from being the ideal set-up, it has gradually served to eliminate the hospital practice of an all-round family doctor and concentrated it in the hands of those who profess a specialty. The reaction of the public has been, "If my doctor cannot take care of my child as well as me, what kind of a doctor is he?" And while it may be unwise to believe that the closing of hospital staffs throughout the country was motivated by selfishness alone, it is not unusual to find a newcomer in a community with restricted privileges, while those men who have resided in the community over a long period of years have unlimited privileges despite inadequate training. It is well known that in many areas cliques of doctors do restrict the privileges to their select few.

I greatly fear that many of the surgical procedures which are looked on by the surgeon as requiring a great deal of technique in reality do not. Many general practitioners are forced to do hemorrhoidectomies in the office because the surgical staff will not give him these privileges. Yet these same hospitals may permit him to deliver a baby, though the mortality and morbidity to both mother and infant are infinitely higher than may be expected from hemorrhoidectomy. Many a general practitioner is forced to do a diagnostic dilation and curettage in his office because the privilege of doing them in the hospital is restricted to the surgeon.

I have an x-ray in my office as a matter of service and convenience, and my good friend the radiologist aids me and has never accused me of trying to usurp his specialty. I have an electrocardiogram for the same reason and my friend the internist aids me without accusing me. Yet, I have no desire to be either a radiologist or a cardiologist. Why shouldn't the surgeon offer me the same courtesy and assistance? Many of us have no surgical aspirations whatsoever, but we do feel that certain surgical procedures can and should be done by the family doctor. As general practitioners who are endeavoring to keep abreast of the practice of medicine, the majority of us feel that we know our limitations, that we have no desire to encroach upon someone else's territory, that we place the welfare of the patient above all else, that we have an unlimited belief in the future of general practice, or we would not be doing it.

If the system of closed staffs and hospitals were fair and just, then the plan of the American Academy of General Practice for General Practice Staffs would not be necessary, but the plan is approved by the American Medical Association, the American College of Surgeons, and the American Hospital Association. The inference, then, is that somewhere between the hogwash of the ivory-towered altruist and the grasping of the unscrupulous worker (either general practitioner or specialist) lies the fundamental truth: that both specialist and general practitioner need a place in the medical sun and someday the pendulum may come to rest.

Edwin Matlin, M.D.,
27 Baltimore St.,
Mount Holly Springs, Pa.

SCHEDULES OF ANTIBIOTIC ADMINISTRATION

To the Editor:—Your editorial on "Schedules of Antibiotic Administration" in the April 21 number of The Journal appears to me to be confusing and to neglect consideration of most important evidence available on the subject. I cannot agree that any uncertainty as to the most effective dosage schedule of antibiotics will be resolved by conclusive information "as to whether the mechanism of their action in vivo is the same as that in vitro or whether host factors may supervene to augment and to supplement their direct bactericidal effect." Neither do I follow the reasoning that leads to the conclusion that "the concentration of penicillin at the focus of infection should *probably* be maintained at the maximally effective level" (italics mine). Instead of attempting to solve the problem of the most effective dosage schedule of penicillin by speculation and reasoning from extraneous data as to its action in vitro, would it not be better to heed old John Hunter's advice to Jenner, ". . . but why think? Why not try the experiment?" In fact, in the third paragraph of your editorial, which completely contradicts the "probable" conclusion arrived at in the second paragraph, it is admitted that Hunter's advice has been taken by some bold souls: ". . . clinical experience has shown that many infections can be adequately controlled by intermittent treatment, with long penicillin-free intervals."

Although these findings refute the belief that a constantly maintained critical concentration of penicillin is essential for satisfactory therapeutic response, they do not permit decision as to the relative effectiveness of frequent or widely spaced administrations of the drug. This decision will be made neither by consideration of speculations on in vitro data nor by studies in severely ill patients. We can, however, set up rigidly controlled experiments in animals which should help in a decision. We can judge most effective therapy in our animal experiments as that requiring the smallest total dose of penicillin to produce a stated curative result. In patients, it is not easy to define the criteria that should be used in determining the most satisfactory or most effective dosage schedule. The first requirement should be the cure of all cases of infection or attainment as near as possible to that ideal. In addition, the number of toxic reactions and the discomfort and inconvenience to the patient must be considered. The cost of and the requirement of the doctor's and the nurse's time in administering the treatment schedule might then be taken into consideration.

The concept of the necessity of a maintained concentration of penicillin in the blood for effective treatment appears to have been a transfer by analogy from therapy with the sulfonamides. Jawetz (*Arch. Int. Med.* **77**:1 [Jan.] 1946) showed that, where measurable blood concentrations persisted for only one hour after injection of penicillin, the depression of bacterial population in a streptococcic infection of mice persisted for at least eight hours. White and his co-workers (*Proc. Soc. Exper. Biol. & Med.* **67**:199 [Feb.] 1948) and Zubrod (Bull. Johns Hopkins Hosp. **81**:400 [Dec.] 1947) studied various schedules of penicillin dosage against a hemolytic streptococcic infection of mice and found that the survival rate was not affected by the number of fractions into which the total dose was divided nor by the interval between doses. Gibson (*Proc. Soc. Exper. Biol. & Med.* **67**:278 [March] 1948) found that the total daily curative dose of penicillin administered to mice infected with pneumococci was the same whether injections were made at 12 or at three-hour intervals. Schmidt and associates (*J. Pharmacol. & Exper. Therap.* **96**:258 [July] 1949) showed that the cure of rats infected intraperitoneally with pneumococci can be accomplished by the administration of penicillin at either frequently spaced or at widely spaced intervals. With a treatment period of 96 hours, two, four and eight-hour dosage schedules were essentially equal in effectiveness, and each of these regimens was more effective than the 12 or 24-hour schedules. With procaine penicillin, injection at 24-hour intervals was only one-fourth as effective as aqueous penicillin at two, four and eight-hour intervals. The data showed that sustained plasma concentrations of penicillin are not at all necessary for a maximum therapeutic response.

In a further study of lobar pneumonia produced by the same Pneumococcus in the rat, Schmidt (personal communication) has found that 12 doses of penicillin at eight-hour intervals are more effective or take less total penicillin to cure than either 24 doses at four-hour intervals or 48 doses at two-hour intervals. Although Eagle has been the main proponent of the necessity of maintaining an effective concentration of penicillin in the blood for most effective therapy, in a recent paper (*Am. J. Med.* 9:280 [Sept.] 1950) he presents data on experimental infections which do not support this opinion. In a pneumococcic infection of mice and a streptococcic infection of rabbits, his data show that, "when with a fixed total number of penicillin injections the interval between them was progressively increased, the dosage necessary for cure at first decreased to reach a minimum but thereafter again increased." Miller and co-workers (*Proc. Soc. Exper. Biol. & Med.* 74:62 [May] 1950) using different dosage schedules of penicillin in the treatment of a penicillin-resistant S. typhosa infection in mice, found that the total amount of penicillin necessary for cure increased as the daily dose was split into more and more injections.

The last experimental investigations on the dosage schedule of penicillin mentioned above make one wonder whether intermittent dosage with aqueous penicillin may not be more effective than continuous dosage or the use of a depository preparation in many human infections. In fact, recent experience with the treatment of pneumonia with aqueous penicillin at 12-hour intervals suggests that this may be so.

Streptomycin, when first introduced into clinical use, was given every few hours from analogy to the dosage schedule of the sulfonamides. Zubrod found (*Bull. Johns Hopkins Hosp.* 82:357 [March] 1948) that, in the treatment of mice infected with Klebsiella pneumoniae with streptomycin, there is no significant difference in results with dosage schedules of four-hour intervals or of eight-hour intervals. Feldman and Hinshaw (*Am. Rev. Tuberc.* 55:428 [May] 1947), in a study of tuberculosis in guinea pigs, found that the administration of streptomycin at frequent intervals was not essential for successful therapy.

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[Dr. Marshall's letter was referred to the writer of the editorial, whose comment follows.—Ed.]

It seems to me that Dr. Marshall has missed the essential point of the editorial, which was that the therapeutic efficacy of penicillin appears to be measured by the total time, *not necessarily continuous,* for which it remains at effective levels at the focus of infection. The editorial did not even suggest that "a continuously maintained critical concentration of penicillin is *essential* for satisfactory therapeutic response" (italics mine), nor have I made that point in my own papers. All the data in hand indicate that penicillin cures infection primarily because it kills bacteria and that its efficacy is measured quite simply by the total time for which it is present in effective concentration. I am not clear as to just what Dr. Marshall is suggesting as an alternative thesis; but all the points he raises in his letter are wholly consistent with the editorial, and every one of the papers he cites was considered in detail in the two papers on which the editorial was largely based (*Am. J. Med.* 9:280 [Sept.] 1950; *Ann. Int. Med.* 33:544 [Sept.] 1950).

Dr. Marshall's letter raises three general points as militating against the therapeutic importance of the penicillin concentration:

1. Animals or human beings may be cured by treatment schedules in which there may be long penicillin-free intervals. This point was considered in detail in both of the papers cited above. As there shown, and as stated in the editorial, an intermittent schedule will be effective provided that the surviving bacteria are not given sufficient opportunity between injections to recover and remultiply: but it owes its activity to the time for which penicillin remains at effective levels. This was clearly shown in both of these papers; in pleading for experimental data, Dr. Marshall appears to have overlooked the data there given. Similarly, the fact that a fixed number of injections may be more effective if given, for example, every 4 hours than if they are given every hour was shown to follow from the longer aggregate "penicillin-time" in the former instance.

2. The fact that experiments can be set up in which a single injection is more effective than multiple injections is quite simply explained by the fact that, in an infection which is rapidly cured by penicillin (e. g., mice freshly inoculated with small numbers of pneumococci or streptococci), subdividing the single curative dose may reduce the dosage per injection to the point that an effective level is no longer provided. This is, however, a specific case which has no general validity. If the infection is such that a relatively long "penicillin-time" is required for cure, the curative dose on the divided schedule may be and usually is a minute fraction of that necessary when given in a single injection. With the same organism and with the same host, one may obtain both types of result, depending on the size of the inoculum and the age of the infection. In all cases, however, the therapeutic activity is determined by the aggregate time for which penicillin remains at effective levels. Here again, the experimental data are perfectly clearcut.

3. The time for which penicillin remains at *measurable* concentrations in the serum bears no necessary relation to the time for which it remains at *effective* levels at the focus of infection. With some organisms, susceptible only to high concentrations of penicillin, the duration of the therapeutic effect may be much less than the time for which penicillin remains at measurable concentrations; while with highly sensitive organisms, requiring less than, for example, 0.01 microgram per cubic centimeter, effective levels and a therapeutic action may persist for a much longer time than a "measurable" serum level of, say, 0.03 microgram per cubic centimeter. One can cure syphilis in rabbits with dosages of penicillin which never provide measurable serum concentrations but which do provide in the tissue fluids the effective level of 0.002-0.005 microgram per cubic centimeter.

I can only repeat that all the data in hand, including the evidence cited by Dr. Marshall, indicate that the therapeutic activity of penicillin is determined by the total time, not necessarily continuous, for which it remains at effective levels at the focus of infection. Depending on the concentrations necessary and the time required for cure, a single injection may prove more effective or far less effective than the same dose divided into multiple injections; and intermittent therapy, with long penicillin-free intervals, will be just as effective as sustained concentrations, provided that the bacteria are not given an opportunity to recover and remultiply.

MISMATCHED BLOOD TRANSFUSION

To the Editor:—In The Journal of March 31 (145:978) there is a clinical note on successful treatment of mismatched blood transfusion by alkalinization with sodium bicarbonate. The authors consider that this treatment is not generally known, but surely it should be known by now, as it was used for blackwater fever (where there is similar hematin blockage of renal tubules) some 30 years ago. We stressed its value in mismatched blood transfusion in a paper written in 1925 (*Brit. J. Exp. Path.* 6:247).

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COUNCIL ON INDUSTRIAL HEALTH

DISASTER BLUEPRINT FOR THE INDUSTRIAL PHYSICIAN

The following recommendations apply to those industries of sufficient size to justify a civil defense industrial health program. If a plant does not feel able to participate because of size, location or other reason, the local civil defense administration should be consulted for advice and assistance. Each program must be tailored to meet the needs of the individual plant and integrated with the community civil defense planning.

There are two major phases of planning: (1) specific disaster control preparations by industrial physicians, and (2) general disaster control preparations by industrial physicians. It must be emphasized that both phases start *now* and proceed simultaneously.

The following should be done in preparation to make disaster effects less disabling to the civilian population in industry.

I. SPECIFIC DISASTER CONTROL PREPARATION BY INDUSTRIAL PHYSICIANS

In case of disaster, industrial management and the medical director must be prepared to meet the emergency. This can be accomplished by organizing and mobilizing a plan now, and integrating it with the community civil defense organization. Local conditions will undoubtedly influence certain details; however, the basic essentials as outlined below should act as a fundamental framework for all industrial health service planning in preparation for effectively handling a major disaster situation.

A. *Scope of Medical Service.*—The industrial medical service should be set up to act as a casualty clearing station in case of disaster so that it can cooperate with the community emergency first-aid services as outlined by the Federal Civil Defense Administration.[1] In event that the disaster directly involved a given industry, the plant medical service would administer first aid to the casualties. This would be limited primarily to splinting of fractures, controlling hemorrhage, treating shock, emergency treatment of burns, and relieving of pain. The seriously injured would then promptly be transported to designated hospitals. Next, the ambulatory casualties would be treated and sent home or to a designated hospital, depending on the severity of the injury.

The following suggestions delineate industry's role in disaster planning under four specific circumstances:

1. When a given industry is involved but not completely annihilated, and with a functioning medical unit in the plant at the time.
2. A given plant is involved as above, but a major portion of its medical staff is outside the plant at the time.
3. A given plant and its medical facilities are left intact but adjacent areas, including the homes of some of its workmen, are involved.
4. The target area is at a considerable distance from the plant in question.

Obviously, the duties of a plant's medical personnel will differ not only under each of the above circumstances, but also will vary with the size of the plant, the kind of medical service, and its relationship to a primary or secondary target area. All of these factors must be taken into consideration in planning the most effective utilization of industrial medical services in the event of disaster.

First, as to the organization of a plant medical service to meet disaster, the following suggestions are offered:

1. Every industry should draw up tentative plans for the organization of its medical defense program and submit them to its local Civil Defense authority for approval and coordination with local Civil Defense plans. Responsibility should rest with the plant's medical director who will coordinate these plans with the plant's entire defense program as well as that of the community. Plants without the regular services of a physician should contact the local Civil Defense authorities for advice.
2. Every plant with a full-time industrial physician in charge of the medical service, and particularly those which are isolated or spread over sufficient area to cause transportation to become a problem, should organize mobile first-aid units patterned after the recommendations made by the Federal Civil Defense Administration in its manual, "U. S. Civil Defense, Health Services and Special Weapons Defense."[1] These units should be capable of moving into the stricken area quickly to support the local Civil Defense units. These mobile first-aid units are in addition to the fixed medical services in the plant.
3. Smaller plants everywhere should pool their medical resources and support the organization of similar mobile units in coordination with the community Civil Defense plans.

The ability to work smoothly as a team should be fostered by frequent trial runs under simulated disaster conditions, both separately and in conjunction with local air raid drills.

The following suggestions are offered as a basis for planning the plant's medical services under the four specific circumstances mentioned above:

1. It should be recognized that should any part of a plant be involved in a disaster, and even if the medical personnel and its supplies are spared, which is unlikely, the plant's own medical staff would be wholly unable to care for the large number of casualties among its own employees. On the other hand, the rest of the community is faced with a similar overwhelming of its medical facilities for a period of time before it recovers from its initial shock and help begins to arrive from surrounding communities. Assuming that casualty collecting stations have been designated beforehand and that there is no complete breakdown of the transportation system, the primary responsibility of the plant's medical unit will be to evacuate its casualties to the clearing stations as quickly as possible. Therefore, planning should be based on providing for the inspection and classification of all casualties so that the transportation system is not bogged down with dead and dying, and so that the limited facilities of the medical department are used to greatest advantage. In general, it will probably be impossible to do more than control gross hemorrhage, relieve pain, and apply only such dressings and splints as are absolutely essential to permit the evacuation of the patient. If for any reason the casualties cannot be evacuated, the fate of the seriously injured will depend on the ingenuity and resourcefulness of the medical personnel and the speed with which essential medical supplies can be brought into the plant.
2. When a majority of the medical personnel is outside the plant at the time that disaster strikes, as might happen in a night attack, the problem is mainly one of planning for the staff to proceed to the stricken plant as quickly as possible. The smaller plants will, no doubt, depend largely on the community defense program for relief, but the larger plants with well-organized mobile first-aid stations adequately equipped and stored at a safe distance from a primary target area, should be expected to move quickly into the area. Although such units should be primarily responsible for their own plants, they should be cleared through the Civil Defense control officer who will advise them of the area of destruction, route to be used, and other instructions essential to a coordinated plan of action.
3. When the adjacent community is involved, and after all of the in-plant casualties have been treated and evacuated, the industrial medical service personnel will then be available to move into the involved community area. Whether it does so as

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This is a special report made by the Subcommittee on Defense of the Committee on Industrial Health-Defense of the Council on Industrial Health, American Medical Association. The members of the Subcommittee are Dr. Charles-Francis Long (Chairman), Bayuk Cigars, Inc., Philadelphia; Dr. Paul Bamberger, Bethlehem Steel Company, Bethlehem, Pa.; Dr. Jean S. Felton, Medical Director, Oak Ridge National Laboratory, Oak Ridge, Tenn.; Dr. Robert H. Flinn, Consultant, Health Office, Health and Welfare Division, Federal Civil Defense Administration, Washington, D. C.; Dr. Irving R. Tabershaw, Director, Eastern Medical Division, Loss Prevention Department, Liberty Mutual Insurance Company, New York, and Dr. J. F. McCahan, Assistant Secretary, Council on Industrial Health, American Medical Association, Chicago.

[1] (*a*) Health Services and Special Weapons Defense, Publication Ag-11-1, Executive Office of the President, Federal Civil Defense Administration, Washington, Superintendent of Documents, Government Printing Office, December, 1950. (*b*) Manual of Industrial Hygiene and Medical Services in War Industries, edited by W. M. Gafafer, Division of Industrial Hygiene, National Institutes of Health, United States Public Health Service, Philadelphia, W. B. Saunders Company, 1943.

a mobile unit or whether each individual is assigned to other units will depend on the organization of the plant medical department and the plan of action drawn up in cooperation with the local Civil Defense authorities. If possible, the plant medical unit should be utilized by Civil Defense as a unit.

As soon as emergency casualty care has been completed in the community, the industrial medical service team should return to the plant to assist in the re-establishment of production. Disaster casualties should go to mobile first-aid stations, fixed casualty dressing stations, or their attending physician for re-dressings until such time as they are given written approval by the attending physician for return to work. They should then clear through the plant medical department unless it is completely overwhelmed by emergency work. Under these circumstances the safety supervisors or foremen should be responsible for screening the employees before they resume work. Even after the injured employees resume work, the industrial medical service may need staff assistance and supplies from the community civil defense administration if they are going to be able to assume after care re-dressings. This will allow the industrial medical service to function effectively to furnish health and emergency service to those employees who are already back on the production line.

4. When disaster strikes at some distance from the plant, it should be expected that every effort will be made to maintain production of essential materials. The plant's medical department should be expected to retain at least a skeleton staff to provide for the essential medical needs of the workmen remaining on the job. The size of this staff should be determined beforehand and all personnel not absolutely essential for a minimal medical force should be dispatched to the stricken area, either as a unit or as part of a unit, depending on the number of medical personnel available for this purpose.

B. *First Aid Training.*—Industrial management should provide first-aid training utilizing the medical service staff, safety department and/or the Red Cross to conduct the courses. The medical director should be in charge of the training and be responsible for designating a number of trained intelligent individuals as instructors who in turn should train additional instructors, depending on the size of the plant. It should be desirable for every employee to receive basic first-aid training. It is the responsibility of the medical director to determine the number of first aiders to be trained, to advise management as to these needs, and to make sure that an adequate number are trained. A minimum of 12 hours instruction should be given each employee. Each employee should be issued a small pocket-size simplified first-aid manual. Employees should be trained to work as a team, but to emphasize also, that with great numbers of casualties, it may be necessary for them to work in pairs or perhaps even individually. The fundamental purpose of first-aid is to prepare the patient for transportation in such a way that he has a chance to get to a treatment center alive and in no worse shape then he started out. No more.

First-aid teams should be established consisting of *six* persons, four of whom are physically capable of functioning as litter bearers. The two remaining members of the team should have advanced first-aid training so that they could act as team captains in supervising the work of all others who are available and qualified to help.

Litters should be provided in the following number as a minimum: [1]

1- 99 employees: 1 litter for each 25 persons
100-499 employees: 1 litter for each 50 persons (minimum 4)
500 or more employees: 1 litter for each 100 persons (minimum 10)

C. *Rescue Squads.*—This is not primarily a responsibility of the medical service. However, its work must be integrated with that of the medical staff so it is important for the two groups to coordinate their planning.

The number of these rescue teams as well as their equipment and training will depend to a great extent on the type, size and location of the plant. They should have basic first-aid training and be familiar with the potential hazards that exist within the plant as well as those that may be present in other industries in the adjacent area. They should receive basic training in the detection and de-contamination of areas affected by chemical, electrical, radiation or biological factors. The rescue squads will have to depend on monitoring teams to advise them regarding entrance into contaminated areas. In a limited number of industries monitoring teams will be established as part of the in-plant defense program; however, in most instances their service will only be available through the local civil defense administration. These monitoring teams should be advised by each plant of its needs and also informed of any hazardous materials or processes that might contaminate the area in case of disaster.

D. *Equipment and Supplies.*—1. Estimated Requirements: Requirement for one mobile first-aid station equipped to treat 500 casualties are shown in Table 4.36 and 4.37, page 57, "Health Services and Special Weapons Defense." [1a] Individual industrial health services can use these two tables as guides in selecting equipment and supplies to fit their needs as determined by size of plant and estimated casualties as determined by the method set forth in Fig. 1.48, page 16, "Health Services and Special Weapons Defense." [1a]

2. Other Equipment: This would include gas masks, oxygen resuscitation apparatus and special types of protective clothing for rescue work. The amount and type of equipment necessary would vary with the requirements of the plant.

3. Expendable Supplies: In plants where industrial medical services already exist, the supplies should gradually be increased not to exceed 20 per cent in excess of normal inventory, and only to include first-aid materials such as dressings and bandages of various types, and not to include plasma and other similar supplies.

Many industries do not have in-plant first-aid or medical services available. The Council on Industrial Health of the American Medical Association has a reprint "The Industrial Medical Department," available upon request, which is designed to act as a guide in developing a medical department in plants of various sizes. Sample floorplans are given and check lists of basic equipment and supplies are enumerated.

Supplies of certain items are already short so that rapid build-up of inventory would seriously affect the availability of current needs. The Civil Defense Administration is planning to stockpile materials on the periphery of target areas which will be moved in as needed. The industrial medical service should depend on this source of replenishing of supplies as needed at the time of disaster. Ambulances and other casualty transports should be used to bring in the supplies on their return trips from the hospitals to the disaster areas.

E. *First-Aid Boxes.*—The number of first-aid boxes should be determined by each plant as follows:

1- 99 employees: 1 box for each 25 persons
100-499 employees: 1 box for each 50 persons (minimum 4)
500 or more employees: 1 box for each 100 persons (minimum 10)

Type of Box: The inside dimensions of the box must afford a total of 540 cu. in. of space, (e. g., 10 in. by 9 in. by 6 in.) to contain the supplies listed below. A box that will resist weather and reasonably rough handling must be used. As metal becomes more scarce, weather resistant masonite, ply-wood and other similar substitutes can be used. A carrying device such as will hold the box and allow it to be slung over the shoulder or carried like a knapsack is essential so that the hands can be left free to facilitate climbing over obstacles which would be present in the disaster area.

Contents of Box: The box should contain:

Triangular bandages	12*
Square yard of gauze mesh folded	2
3 in. by 3 in. gauze pads, individually wrapped	24
2 in. roll bandage	6
Single-edge razor blades	6
Ammonia inhalants	6
Marking pencil	1
Lipstick	1
Identification tags as specified by CDA	6
Safety pins	12

* Minimum.

Replacement supplies should be stored at strategic locations throughout the plant, preferably in shelter areas. It should be kept in mind that clean clothing, yard goods and handkerchiefs make desirable auxiliary dressing supplies. Plants with women employees should bear in mind that the common sanitary napkin makes an excellent and easily applied emergency dressing.

F. *Transportation and Communication.*—Transportation and evacuation facilities must be established within the plant and integrated with the Civil Defense planning in the community.

Communication facilities will include telephone, radio and messengers. In the event of a major disaster, telephone service would undoubtedly be interrupted so that messengers might be shared by the first-aid teams, rescue squads, demolition crews, firemen and others in keeping in touch with the plant central control officer.

II. GENERAL DISASTER CONTROL PREPARATIONS BY INDUSTRIAL PHYSICIANS

A. *Health Services Inventory.*—Make an inventory of industrial health facilities, services and personnel. This would give the civil defense administration an index of industrial health services potential and distribution.

1. Objectives: The purpose of this inventory is to obtain adequate information, whether by means of a questionnaire, inspection or both to permit a more accurate appraisal of the ability of industry's health services to meet the ordinary needs of an industrial population engaged in all-out preparation for defense. Such information is equally essential for an appraisal of industry's readiness for the extraordinary requirements of defense against attack, whether by atomic bomb, guided missile or conventional strategic bombing. Finally, it is necessary for the most effective coordination of industrial and civilian defense efforts and for the pooling of a community's resources in the event of disaster.

2. Scope: The inventory should be sufficiently broad to permit local, state and national defense authorities to access accurately each plant's ability to meet its own defense requirements and still contribute to the pooled resources of the community, the state and the nation. Although specialists in other fields will be needed, and materials and facilities other than medical should be inventoried, this inventory will be limited to medical and closely allied services.

3. Procedures: The following is suggested as essential information although by no means is the list to be considered complete or the possibilities of the questionnaire exhausted.

(*a*) Identification, location, description. This should include the name of the plant, parent company and headquarters, if any, exact location, size in terms of area covered, floor space, number of buildings or some other guide to its size, including present plant population and estimates of the maximum anticipated population based on past experience.

(*b*) Medical department personnel. Personnel should be named and described, and indicated as "on call," "part-time" or "full-time." The exact time spent in the plant by part-time physicians should be noted. The person in charge of the medical department or health services and the person (and title) to whom he or she reports should be indicated. Other medical department personnel to be listed are registered male and female nurses, industrial hygiene personnel, laboratory and X-ray technicians, practical male and female nurses, orderlies, medical secretaries, typists, clerks, ambulance drivers, and chauffeurs if under medical department supervision exclusively (not from motor pool).

(*c*) Hospitals, dispensaries, first-aid stations. The name of the hospital or hospitals to which injured employees are ordinarily taken and the approximate distance of each from the plant gates. State if there is provision made for reserving beds for employees, the number of such beds and the total number of beds in each hospital. Give the number of dispensaries and first-aid stations within the plant, the nominal floor space, number of beds, description of how each is staffed, and the average daily admissions or treatments given in each. State the number of beds or cots available on short notice for use in a catastrophe and whether stored within or outside the plant.

(*d*) Storage of medical supplies and equipment. How much expendable medical supplies are stored in the plant in terms of the estimated time in which they would normally be used? Are additional supplies and/or equipment stored elsewhere for safety? Does the plant maintain its own blood bank? How much blood, plasma, intravenous solutions, if any, are stored in the plant, in a hospital and/or elsewhere? How many litters, blankets, respirators, gas masks, first-aid kits are available in the plant or stored elsewhere? If more than one, are they distributed about the plant, or stored in a central location? Who has charge of distribution and inspection of the above equipment?

(*e*) Health and related services. State which of the following services are provided in the plant dispensaries: major surgery, minor surgery, and reduction of fractures requiring general anesthesia (intravenous or inhalation) or spinal anesthesia, suturing and dressing of minor wounds; first-aid only; pre-employment physical examinations; periodic physical examinations; pre-employment chest x-ray; periodic chest x-ray; x-ray of injured parts; other x-ray service; complete clinical laboratory service; blood typing service; simple urine and blood examinations. Which of the following related services are provided and if not by the medical department, by whom? Training in first-aid, artificial respiration, rescue, gas-mask training, litter-bearing and improvising, radiation monitoring, decontamination, demolition. Are employees trained in first-aid as teams or individually?

(*f*) Miscellaneous. Are dispensaries and first-aid stations provided with auxiliary heating and lighting facilities? Are "bomb-proof" shelters provided? Are they equipped with cots, medical supplies and auxiliary heating and lighting, to be used as clearing stations for casualties?

B. *Consultants.*—The Committee recommends that competent consultants in industrial health and hygiene be available to Civil Defense Administrations wherever organized. They would be responsible for assessing the strength of health services in the various areas through application of the health services inventory. This information would then be tabulated as to classes of industry following the pattern of breakdown already established by the National Safety Council.[2] After the surveys have been completed locally, they should then be centralized for national tabulation. Information thus assembled can function as a yardstick for an individual industry to use in assessing its needs.

All industry should have access to expert industrial health service advice as it relates to disaster planning. This should be available through the consulting service of the civil defense administration.

C. *Immunization.*—The industrial population should understand the need for an immunization program. Cooperation of press, radio, Civil Defense groups, labor unions and management as well as industrial physicians and private practitioners is needed to successfully carry on an immunization program of this scope.

Immunization against small pox, typhoid fever, paratyphoid A and B, and tetanus is urgently recommended.

Influenza and diphtheria immunizations should be administered in areas of epidemic outbreak.

In areas where certain diseases are endemic such as yellow fever and typhus and when the efficacy of immunization has been established, it should be carried out.

D. *Blood Typing.*—This Committee endorses the efforts of the Red Cross and other interested agencies to meet quotas for blood now needed for the Armed Forces and for plasma manufacture. It is a necessary effort and must not be confused with our discussion of blood typing. Regardless of present needs, this Committee strongly urges blood typing in industry *now*, beginning with the employees in large industries in and adjacent to all target areas. The purpose is to discover and tag all "O" class potential donors between 18 and 60 years of age. In this way there will be set up a "walking blood bank" so that without worry concerning storage, viability or erythrocyte freshness, physicians will have at hand immediately a huge pool of available blood carried in the veins and arteries of the "O" group survivors. We know that if disaster strikes any of our industrial centers the need for blood within the first four or five days will be so astronomical that creating this "walking blood bank" is the only answer our Committee can conceive to the solution of the problem.

We would warn those officials in Civilian Defense responsible for providing blood that they must move now to store blood-letting apparatus on the periphery of target areas and set up classes to train nurses, technicians, and possibly even nurses' aides in the techniques of blood collecting.

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[2] National Safety Council, Chicago.

BUREAU OF LEGAL MEDICINE AND LEGISLATION

MEDICOLEGAL ABSTRACTS

Sherman Anti-Trust Act in Relation to Medical Society Sponsored Prepaid Medical Care Plan.—The United States filed an action against the Oregon State Medical Society, the Oregon Physicians' Service, and a number of individual physicians to restrain the alleged violation by the defendants of the Sherman Anti-Trust Act. The case was heard in the United States District Court, District of Oregon.

The government contended that the defendants, beginning in about 1936, conspired to restrain and monopolize prepaid medical care in the State of Oregon, and that they did restrain and monopolize the prepaid medical business in the areas in which they operated. The following findings of fact, among others, were made by the trial court.

The Oregon Physicians' Service is a corporation incorporated under the laws of the State of Oregon, having its office and principal place of business in Portland and it furnishes prepaid medical, surgical, and hospital care on a prepaid contract basis. It is sponsored and approved by the Oregon State Medical Society and the great majority of its stockholders and participating physicians are members of that society. None of the defendants, either at any of the times set forth in the complaint or at any other time, have attempted to, or have been engaged in any combination or conspiracy to, restrain or monopolize the business of selling or furnishing prepaid medical care in the state of Oregon or elsewhere or to restrain or monopolize interstate trade or commerce in said business: Prior to 1941, some of the defendants advised doctors not to cooperate with commercial prepaid medical care organizations in certain practices engaged by them, but such action was not the result of any conspiracy or combination or attempt to restrain or monopolize the business of prepaid medical care, but was for the purpose of maintaining the standards of medical practice. Prior to 1941 the defendant Multnomah County Medical Society expelled certain members who were associated with certain types of contract practice and threatened the expulsion of other members so engaged, but such action was not the result of any combination, agreement or conspiracy in restraint of trade or commerce or otherwise; it was for the purpose of maintaining and advancing the standards of medical practice. No other defendant has ever expelled, threatened or incited the expulsion from medical societies of any doctors because of any cooperation in prepaid medical care plans, and since 1941, none of the defendants has expelled, threatened or incited the expulsion from medical societies of doctors cooperating in medical plans other than those sponsored by the defendants. The defendants have formed and promoted certain prepaid medical care plans, but such action on the part of the defendants was not pursuant to any conspiracy, combination or attempt to restrain or monopolize trade or commerce and was not with the intent to drive out, hinder and obstruct commercial prepaid medical care plans operating in the State of Oregon, but it was with the intention to legitimately compete with such commercial medical care plans. None of the defendants at any time has interfered with, or attempted or combined or conspired to interfere with, commercial prepaid medical care organizations in obtaining hospital facilities for their members. None of the defendants at any time has refused to treat patients or caused others to refuse to treat, or combined or conspired to refuse to treat any patients who were members of any prepaid medical care plan, or discriminated against any such patients by reason of such membership.

Oregon Physicians' Service was intended to be an agency, and has in fact been an agency, to provide a prepaid medical care plan in Oregon by a doctor-sponsored group in areas where such a plan had not yet been organized by the local doctors, and in cases where groups of patients live or work in more than one county, and in cases where the local doctors' plan has not yet provided for auxiliary contracts, such as "family contracts" or "individual contracts." Oregon Physicians' Service provides for medical and hospital care, in one form or another, in every county in Oregon. Most of the doctors participating in the local doctor-sponsored plans are also participating physicians of Oregon Physicians' Service. No local plan of prepaid medical care sponsored by doctors of any county has attempted to sell contracts for prepaid medical care in other counties without the consent of the doctors in such counties who would render the services provided in said contracts. The reasons for these policies are, first, that defendants believe that doctors should not attempt to sell the services of other doctors without their consent, and, second, competition between two doctor-sponsored plans in a single county is impractical, since the same doctors must render services under whatever plans are in operation. These policies and the carrying out of these policies have not been a result of any conspiracy or combination in restraint of trade or commerce and have not resulted in restraining or monopolizing the business of selling or furnishing prepaid medical care.

Defendant medical societies are voluntary associations and membership or nonmembership in any of defendant societies has no effect on the privilege to practice medicine in Oregon under state laws. Membership on a hospital staff in Oregon is granted or withheld by the governing body of the particular hospital and has not been granted or withheld from any doctor because of his connection with any prepaid medical care organization, whether such organization was sponsored by defendants or not. No doctor has been deprived of any staff membership in any hospital in Oregon because of his connection with any prepaid medical care organization not sponsored by defendants.

The practice of medicine as conducted within the State of Oregon by doctors of Oregon, including defendants, and the sale of medical services, by doctor-sponsored organizations, as conducted within the State of Oregon, are not trade or commerce within the meaning of Section I of the Sherman Anti-Trust Act, nor is it commerce within the meaning of the constitutional grant of power to Congress "To regulate Commerce . . . among the several States."

Some or all of the defendants have participated in the preparation and promulgation of schedules of fees to govern charges to be made by doctors in the furnishing of medical and surgical care provided in connection with (1) the prepaid medical care plans of Oregon Physicians' Service and other doctor-sponsored prepaid medical care plans in the State of Oregon, and (2) activities of certain governmental agencies, at the request of such agencies. The schedules of fees used in connection with Oregon Physicians' Service and other doctor-sponsored prepaid medical care plans do not themselves necessarily set forth the actual fees to be collected by doctors, but instead determine the relative proportions of the net profits of such prepaid medical care plans, during any given period of time, to be received by doctors for specified medical services. Doctors participating in said plans agree to accept compensation for services based upon a percentage of the amount available for distribution to doctors after deduction of hospital charges and other expenses.

Except in connection with the rendering of services under said prepaid medical care plans or governmental activities, there has been no attempt by any of the defendants to fix or designate fees or charges to be made by doctors in Oregon in the rendering of medical or surgical services. The fixing of fees is a necessary element and of the very essence of all prepaid medical care plans, whether doctor-owned or privately owned, and all prepaid medical care organizations in Oregon, including commercial companies, fix or designate or determine fees for services under or pursuant to or in cooperation with said plans. In the case of doctor-sponsored prepaid medical care organizations, the purposes of these fee schedules are as stated above; and in the case of commercial organizations, the schedule of fees designates either (1) the amounts to be paid for specified services, or (2) the maximum amounts of indemnity to be paid members of or subscribers to said organizations for fees paid or incurred by them for medical or surgical services.

The expression to "take tickets" means that a doctor rendering services to a member of a prepaid medical care plan sends his statement for services to the corporation or other organization owning or controlling said plan, and accepts checks from said organization. There is no present conspiracy, combination, agreement or concert of action among doctors not to "take tickets" of privately owned hospital associations; nor is there any conspiracy, combination, agreement or concert of action among doctors not to accept payment from privately owned hospital associations. The refusal by doctors to "take tickets" of or accept payment from privately owned associations is not boycott.

On the basis of all the evidence, the trial court concluded that none of the government's charges were proven by a preponderance of the evidence. The question, said the trial court, was whether the Oregon doctors in the formation of their own prepaid nonprofit organization, Oregon Physicians' Service, have violated the Anti-Trust laws. As competitors of the privately owned for profit organizations in the same field, have the doctors transgressed the bounds of legitimate competition? I hold that they have not, said the court. The period from 1936 to 1941 was a period when the doctors were trying to find themselves. It was a defensive period. The doctors felt that they were being exploited. They were trying to maintain their professional standards. They felt the doctor-patient relationship was being destroyed. It was a period of groping for the correct position to take to accord with changing times. The doctors sponsored their own prepaid plan and then repudiated it. What the doctors did during this period was not conspiracy. I really doubt, the trial court continued, that the government believed the operations of Oregon Physicians' Service to be monopolistic. Its two chief competitors are tremendously profitable; they have the cream of the business, going only into selected areas, whereas, Oregon Physicians' Service must go everywhere and has many other weaknesses, inheritant cooperative enterprise. I hold, concluded the trial court, that Oregon Physicians' Service is not a conspriacy, but, rather, an entirely legal and legitimate effort by the profession to meet the demands of the times for broad medical and hospital service, eliminating the evils of privately owned concerns, as well as the element of private profit.

Accordingly the trial judge entered an order in favor of the defendants and dismissing the plaintiff's complaint with prejudice.—*United States v. Oregon State Medical Society, 95 F. Supp. 103 (1950).*

Hospitals: Broken Needle Left in Patient's Arm by Nurse.—This was an action by the plaintiff to recover damages for the alleged negligence of nurses employed by the defendant hospital, a private institution operated for profit. From a judgment in favor of the plaintiff, the defendant hospital appealed to the Supreme Court of Mississippi.

The plaintiff became ill with gastritis and was sent to the defendant hospital. Among other treatments which her physician prescribed for her were several injections of glucose into her body every 24 hours. These infusions were given to the plaintiff by nurses employed by the defendant. The glucose was obtained by the hospital in a bottle ready to be administered to the patient. The nurses, when giving this substance to a patient, would use a rubber tube, at one end of which was a hollow metal tube to be inserted through the cork in the mouth of the jug containing the glucose which was then inverted and placed on a stand above the patient. The other end of the rubber tube had a place for a hollow hypodermic needle. The patient's arm would be immobilized by placing it on a board and strapping it down with adhesive tape, after which the needle would be injected into the arm in the cubital area on the inside of the arm near the elbow. After the injection of the needle, adhesive tape would be placed at this point to hold the needle in place and the glucose inserted into the patient's veins by a drip method. After the prescribed amount of glucose had been administered, the nurse would remove the needle, clean it out with a syringe and send it to a central place where it would be sterilized for future use.

After the plaintiff left the hospital, the place on her left arm where these injections had been made continued to be sore, swollen, with a strong, unpleasant odor and great pain. Four days later her physician treated the plaintiff's arm for the infection, and in succession two other doctors treated her. At the time one of these physicians checked her arm she was in another hospital as a paying patient. He testified that the plaintiff was suffering from an infection consisting of a superficial ulcer in her arm and that when he prepared to change the dressing on it he observed an ulcerated part in the cubital area opposite the elbow about the size of a dime. He stated that "on top of the crust of that area was a metallic object" which "was visible when the dressing was removed" and that he "took a pair of little tweezers and lifted off" the crust. The physician then gave this needle to the plaintiff and the broken piece of hollow needle, about ½ in. in length, was introduced as an exhibit at the trial.

The testimony of the plaintiff's witnesses, not disputed, was that the plaintiff had never had, prior to the infusions in the defendant hospital, any trouble with her arm, nor any injections by needles in her arm, and that after being discharged from the hospital the plaintiff had no such injections. The only persons who had made injections by needle into her arm were the employees of the defendant during the time she was a patient in the defendant hospital. The defendant hospital introduced its hospital records and six nurses who had made them and had administered the glucose infusions to the plaintiff. All of them testified that during none of the infusions had they observed a broken needle. They were not able to identify who had terminated one particular infusion, however. They also testified that they had never seen an infusion needle broken.

There was no dispute, said the Supreme Court, that the piece of needle was removed from the plaintiff's arm, and the jury could well have believe that in the month after leaving the hospital the needle had moved to the surface of the ulcer and finally become visible. The other substantiating evidence, the court continued, was enough to warrant a finding that the needle was inserted and broken off in the plaintiff's arm, by an act of the defendant's servants in the hospital, and that either it was negligently broken off in her arm by the defendant's servants or the defendant was negligent in failing to ascertain that the needle had broken there and in failing to remove it or to advise the plaintiff thereof, or both. The defendant argued that there was no direct testimony, by any eyewitness, of the breaking of the needle in the plaintiff's arm. The Supreme Court said, however, that negligence of this type seldom can be proved by such direct evidence. Circumstantial evidence which offers a reasonable probability of correctness is adequate to support the verdict, the Supreme Court concluded. On the basis of all the evidence, therefore, the judgment of the trial court in favor of the plaintiff was affirmed.—*General Benevolent Association Inc. v. Fowler, 50 So. (2d) 137 (Mississippi, 1951).*

MEDICAL MOTION PICTURES

Guard Your Heart: 16 mm., black and white, sound, showing time 29 min. Prepared by the American Heart Association. Produced in 1951 by and procurable on purchase from Bray Studios, Inc., 729 Seventh Ave., New York 19.

This motion picture tells the story of Sam Taylor, a middle-aged, hard-driving executive. One day he experiences pain in the region of his heart; later he has a nightmare in which his heart talks to him and reproaches him. He is persuaded by his wife to see their family doctor, who cautions him to change his pace and, before making his examination, gives him a lecture about the heart. During this lecture, animated sequences are interspersed with live photography to illustrate the power and endurance of the heart, the way in which it performs its task of circulating the blood, and what takes place in arteriosclerosis and coronary thrombosis. There is also a brief discussion of other heart diseases. The concluding section shows Sam a changed man. He is relieved to learn that nothing is seriously wrong with his heart and that his symptoms are warning signals that he has been going too fast.

This film motivates the individual to live with his heart instead of fighting it, and it also teaches some physiology. However, the physiology, which is explained during the doctor's lecture, would be more meaningful if there were less narration and more visual illustrations. This sequence contains enough material for a film in itself. The suggestion of the producer that a discussion leader prepare his audience for the showing of the film and be ready to answer many questions after the showing is well made. The film is recommended for showing to adult lay audiences, especially persons in or approaching middle age. The photography and sound are good.

MEDICAL LITERATURE ABSTRACTS

AMERICAN

American Journal of Medical Sciences, Philadelphia

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Laboratory Diagnosis of Hyperthyroidism: Practical Analysis of Current Methods, with Presentation of Illustrative Cases. J. D. Hardy and C. Riegel.—p. 359.

Gastric Secretory Response to Insulin Hypoglycemia: Influence of Insulin Dosage and Blood Sugar Level. P. R. Sharick and D. A. Campbell. —p. 364.

*Vitamin D Intoxication. H. Chaplin Jr., L. D. Clark and M. W. Ropes. —p. 369.

Serum Lipids in Lipemia Retinalis. S. C. Carfagno and W. A. Steiger. —p. 379.

*Role of Ketone Bodies in Etiology of Diabetic Coma. P. Fisher.—p. 384.

Combined Salicylate and Para-Aminobenzoic Acid (Pabalate®) in Treatment of Rheumatoid Arthritis. J. L. Hollander and T. N. Harris. —p. 398.

Correlation of Erythrocyte Sedimentation Rates as Determined by Rourke-Ernstene and by Wintrobe-Landsberg Methods. E. A. Mahoney Jr., J. Worcester and B. F. Massell.—p. 402.

Relation of Sodium Chloride Depletion to Urine Excretion and Water Intoxication. W. R. Bristol.—p. 412.

Evaluation of Cuirass Respirator in Acute Poliomyelitis with Respiratory Insufficiency. F. Plum and D. S. Lukas.—p. 417.

Clinical Implications of Pressures Used in Body Respirator. J. V. Maloney Jr. and J. L. Whittenberger.—p. 425.

Mitral Stenosis Without Clinically Demonstrable Left Auricular Enlargement. S. Pariser, J. Zuckner, H. K. Taylor and W. J. Messinger. —p. 431.

Febrile Reactions to Quinidine. W. H. Stimson and V. A. McKusick. —p. 440.

Role of Liver in Detoxification of Tetraethylthiuram Disulphide (Antabuse). E. M. Boyd and C. J. Kingsmill.—p. 444.

Hemolytic Anemia Associated with Liver Disease. G. A. Hyman and H. Southworth.—p. 448.

Temporomandibular Articulation Syndrome. C. M. Epsteen.—p. 457.

Some Aspects of Berylliosis. H. Beerman.—p. 462.

Vitamin D Intoxication.—The literature contains reports of 111 cases of hypervitaminosis-D. The syndrome consists of weakness, fatigue, and weight loss in general; nausea, vomiting, diarrhea, abdominal cramps; headache, paresthesia, and vertigo; depression, mild psychosis, and stupor; normocytic, normochromic anemia; albumin, red blood cells, casts in the urine, with progressive impairment in concentrating ability; frequency and nocturia; band keratitis; elevated serum calcium and phosphorus, with normal or slightly elevated alkaline phosphatase; progressive nitrogen retention; diffuse demineralization of the bones in advanced cases, and periarticular soft tissue calcification. Depending on the severity of intoxication, all or only a few of the above described findings will be present, as indicated in the authors' seven additional cases, which are described in some detail. Six of these patients exhibited band keratitis, a lesion commonly associated with disturbed calcium metabolism. The two most serious of the seven cases were remarkable for the demonstration of calcium-containing cysts, which were located largely in the periarticular areas and in the vicinity of the bursae. These cysts were fluctuant, did not transilluminate, and varied from 1.5 to 8 cm. in diameter. The calcium-phosphorus ratio of the sediments centrifuged from the aspirated fluid of the cysts was more than twice that present in bone. Treatment of the patients consisted of cessation of vitamin D intake, a strict low calcium diet, avoidance of undue exposure to sunlight, avoidance of alkali, maximum mobilization of the patient, and sufficient fluid intake for a daily urinary output of at least 2,000 cc. Some of the patients were given diethylstilbestrol. Vitamin D is a potentially dangerous drug and should be used only in diseases in which there is a reasonable rationale for usage. If it is used in massive doses, careful follow-up is obligatory for early detection of signs of intoxication.

Ketone Bodies in Etiology of Diabetic Coma.—There is still no general agreement as to the specific cause of coma that results from uncontrolled diabetes mellitus. Almost all authors agree that all three of the ketone bodies can have toxic effects if given in large enough doses, and some observers have demonstrated specific effects on the respiratory and other brain centers. Of the three ketone bodies, acetoacetic acid is most toxic, beta-hydroxybutyric acid is less toxic and is in equilibrium with acetoacetic acid, and acetone is a decomposition product with low toxicity. Whether they are toxic in the concentration in which they appear in the blood of patients with diabetic acidosis is unknown. The length of time they are present may be an important factor. A blood ketone level in animals of 100 mg. per 100 cc. may have no effects over a few hours but might be highly toxic if it were maintained for a week. The fact that ketosis is an absolutely constant finding in diabetic acidosis points to a strong relationship between the two. If the ketone bodies are the dominant factor in the production of coma, then some reasonable correlation should exist between the blood ketone level and the clinical state. The author's experiments showed that hyperketonemia can be produced in rabbits in the range observed in diabetic acidosis in man and maintained for several hours without apparent toxic effect. On the other hand, hypertonic saline solution of about three times the tonicity of plasma caused the death of all the animals to whom it was given. In contrast to Schneider and Droller the author believes that death was the result of the hypertonicity of the solution infused and not of the specific agent or quantity of the agent infused. In 25 cases of diabetic acidosis selected from the literature and from the author's practice, there was poor correlation of the blood ketone level with the clinical condition during therapy. Although the general trend of the ketone level was back toward normal limits this may have coincided with, rather than caused the improvement. Even if there were good correlation and good evidence of ketone toxicity, the fact that a substance can be toxic does not necessarily mean that it causes a particular clinical syndrome. It is highly unlikely that the ketone bodies are the primary cause of the clinical picture of coma. It seems more reasonable that they indicate metabolic disturbances without being toxic, just as the blood urea is a nontoxic indicator of uremia.

American Journal of Ophthalmology, Chicago

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Primary Vaccinia of Eyelids: Treatment by Aureomycin. J. H. King Jr. and W. A. Robie.—p. 339.

Roentgen Therapy of Ocular Vaccinia. O. R. Kline Jr.—p. 342.

Topical Cortisone in Treatment of Anterior-Segment Eye Disease. E. H. Steffensen, A. J. Wishbow, F. O. Nagle and others.—p. 345.

Cortisone in Treatment of Phlyctenular Keratoconjunctivitis. P. Thygeson and M. H. Fritz.—p. 357.

*Local and Systemic Cortisone in Ocular Disease. I. H. Leopold, J. E. Purnell, E. J. Cannon and others.—p. 361.

Unilateral Exophthalmos as Forerunner of Thyrotoxicosis. S. L. Saltzman and M. C. Mellicker.—p. 372.

Practical Considerations Concerning Choice of Operation in Convergent Squint: Edward Jackson Memorial Lecture. P. A. Chandler.—p. 375.

Some Ophthalmic Aspects of War Pathology. G. Bietti.—p. 382.

*Solitary Tuberculoma of Sclera in Patient with Multiple Advanced Systemic Lesions: Treated with Streptomycin. S. D. Maiden.—p. 387.

Ocular Tuberculosis Treated with Streptomycin: Report of 14 Cases. P. J. Parisi.—p. 393.

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Ocular Mucormycosis: Report of Case. J. A. C. Wadsworth.—p. 405.

Clinical and Experimental Studies with Tissue Scrapings in External Ocular Diseases: With Additional Reference to Use of Antihistaminics in Herpes-Simplex Infections. J. W. Hallett.—p. 409.

Limbus Tumors as Manifestation of von Recklinghausen's Neurofibromatosis in Goldfish. H. G. Schlumberger.—p. 415.

Accommodative-Effort Syndrome: Pathologic Physiology. R. V. Hill. —p. 423.

Intraocular Biopsy. C. A. Veasey Jr.—p. 432.

Local and Systemic Cortisone in Ocular Disease.—Leopold and his associates analyze the effect of cortisone therapy on various forms of ocular disease. The drug was administered in suspension subconjunctivally and retrobulbarly. One or both of these methods were used in 142 eyes. Systemic therapy was subsequently tried in 10 of the cases in which local therapy failed.

The Association library lends periodicals to members of the Association and to individual subscribers in Continental United States and Canada for a period of five days. Three journals may be borrowed at a time. Periodicals are available from 1940 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied with stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted.

Cases of allergic conjunctivitis, vernal conjunctivitis, corneal ulceration, dendritic keratitis, chemical keratitis, nonsyphilitic atypical interstitial keratitis, marginal ulcers, superficial keratitis, anterior uveitis, and sclerosing keratitis improved with local administration of cortisone. Therapy did not result in complete cure in all the cases. Relapses were frequent. The results of subconjunctival cortisone in posterior uveitis were unsatisfactory. In two cases of posterior uveitis treated by retrobulbar injection there was no significant improvement. No improvement was obtained in cases of ocular pemphigus, erythema multiforme, corneal dystrophy, congenital syphilitic interstitial keratitis, uveitis due to Boeck's sarcoid, Vogt-Koyanagi syndrome, and Harada's disease. No improvement was noted in cases of juvenile and senile macular degeneration following local or systemic cortisone therapy. Retrobulbar administration of cortisone was unsuccessful in macular degeneration and was of questionable value in posterior uveitis and retrobulbar neuritis. In 25 patients cortisone eye drops were used alone, in association with, or following subconjunctival injections of cortisone. These cases included patients with anterior uveitis, scleritis with keratitis, deep keratitis, anterior uveitis following surgery, and one patient with atypical interstitial keratitis. These patients improved following treatment with cortisone subconjunctivally, then relapsed and improved again when cortisone suspensions in drops were started. Topical cortisone used alone was helpful in allergic conjunctivitis, vernal conjunctivitis, and superficial punctate keratitis. In no case in which subconjunctival injections were unsuccessful were subsequent topical cortisone drops beneficial. Systemic administration of cortisone was more successful than subconjunctival cortisone in the treatment of posterior uveitis and of diseases of the anterior segment. Some patients improved only while cortisone was being administered and another group improved only for a while with cortisone therapy but failed to benefit from repeated and continued therapy. There is no method at present by which the permanency of cortisone therapy can be predicted. It is apparently not helpful in degenerative conditions such as dystrophy and macular degeneration. Its chief benefit seems to be in cases with active inflammatory processes.

American Journal of Pathology, Ann Arbor, Mich.

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Biologic Effects of Radioactive Phosphorus Poisoning in Rats. S. Koletsky and J. H. Christie.—p. 175.

Changes in Endocardium of Pigs Simulating Rheumatic Stigmata of Man. O. Saphir and M. Lowenthal.—p. 211.

Glandular Adipose Tissue Associated with Cytotoxic Suprarenal Contraction and Diabetes Mellitus. G. L. Laqueur and M. B. Harrison. —p. 231.

Asymptomatic Focal Arteritis of Appendix: Eighty-Eight Cases. A. Plaut. —p. 247.

Cell Type of Secondary Parathyroid Hyperplasia. G. E. Fritz and O. A. Brines.—p. 265.

*Allergic Granulomatosis, Allergic Angiitis, and Periarteritis Nodosa. H. Churg and L. Strauss.—p. 277.

Post-Traumatic Subcutaneous Granulomas Associated with Crystalline Material. W. W. Ayres, W. B. Ober and P. K. Hamilton.—p. 303.

Giant Cell Foreign Body Reaction to Non-Cholesterol Lipid Plate Crystals: Case Report with Chemical Studies. R. L. Engle Jr.—p. 317.

Glycogen Infiltration (So-Called Hydropic Degeneration) in Pancreas in Human and Experimental Diabetes Mellitus. W. E. Toreson.—p. 327.

Allergic Granulomatosis and Vascular Disease.—A clinical syndrome of severe asthma, fever, and hypereosinophilia, together with symptoms of vascular embarrassment in various organ systems, is described, and observations on 13 cases are reported. The basic anatomic changes in these cases consisted of widespread vascular lesions of the type seen in periarteritis nodosa and of characteristic tissue alteration in the vessel wall and in the extravascular collagen system. The tissue alteration found in these cases consisted of necrosis of eosinophilic exudate, severe "fibrinoid" collagen change, and granulomatous proliferation of epithelioid and giant cells. This is considered a histopathological entity and is designated as allergic granuloma. The granulomatous lesions, both within vessel walls and in connective tissue throughout the body, suggest that this syndrome constitutes an entity apart from classic periarteritis nodosa. This assumption was corroborated by review of 15 cases of periarteritis nodosa without asthma, none of which revealed extravascular granulomas or granulomatous vascular changes. Cutaneous and subcutaneous nodules showing the typical connective tissue alteration are frequent in this syndrome. These are of value for diagnosis by biopsy. Granulomatous lymphadenitis is probably also of diagnostic significance. It is suggested that other allergic syndromes (Loeffler, Zuelzer, Šikl) may represent the more benign forms of allergic granulomatosis, while angiitis is its most malignant manifestation.

American Journal of Public Health, New York

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*Role of Bronchi in Pulmonary Tuberculosis: Review Based on Study of 305 Cases. R. S. Jones and F. H. Alley.—p. 381.

Bronchogenic Carcinoma as Differential Diagnostic Problem in Pulmonary Disease: III. Peripheral Type: Carcinoma Arising from Minor Bronchi and Bronchioles. J. H. Moyer and A. J. Ackerman.—p. 399.

Benign Spontaneous Hemopneumothorax. L. Hyde and B. Hyde.—p. 417.

*Neomycin in Clinical Tuberculosis. D. T. Carr, K. H. Pfuentze, H. A. Brown and others.—p. 427.

*Tuberculostatic Activity of Terramycin. G. L. Hobby, T. F. Lenert, M. Donikian and D. Pikula.—p. 434.

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Clinical Comparison of Several Culture Media in Diagnostic Demonstration of Tubercle Bacilli. C. R. Smith.—p. 470.

Sensitivity to Tubercle Bacilli to Amithiozone (Myvizone). M. Mollov, I. Hill and T. J. Kott.—p. 487.

Bronchi in Pulmonary Tuberculosis.—The morphological forms, incidence, and pathogenesis of bronchial tuberculosis are discussed. A relatively high incidence of endobronchial tuberculosis has been found on bronchoscopic examination of patients hospitalized for pulmonary tuberculosis. Bronchial tuberculosis appears to be more frequent in females and is generally considered to be secondary to parenchymal disease. The authors believe that the initial bronchial disease probably arises by implantation from a parenchymal lesion or from extension of adjacent disease and then spreads along the submucosa. Pronounced tuberculous bronchitis unassociated with an evident parenchymal lesion may occur. Pulmonary tuberculosis often appears as nodular "tubers" connected to both proximal and distal bronchial "roots." The proximal or larger bronchi are frequently stenosed, while the distal or smaller bronchi are occasionally dilated but are oftener destroyed by tuberculous disease. Atelectasis and varying degrees of fibrosis, plasma exudation, and alveolar macrophage accumulation and scattered tubercles accompany this peripheral bronchial disease. Pyogenic, nontuberculous responses are unusual, and nontuberculous bronchopneumonia is rarely found. Lesions of the smaller bronchi are often more numerous and severer than those of the larger bronchi. Tuberculosis of the large bronchi occurs most frequently in association with cavitation and sputum containing tubercle bacilli but occasionally may occur without detectable parenchymal lesions. Proximal bronchial disease may be important in the closure of cavities or in the production of a "blocked" cavity, in the "ballooning" of cavities, or in the production of emphysema. The presence of such bronchial lesions may account for the failure of some diseased lobes to collapse with thoracoplasty.

Neomycin in Tuberculosis.—Five patients with tuberculosis due to streptomycin-resistant tubercle bacilli and one with far advanced tuberculosis of the lungs and carcinomatosis were treated with 0.25 to 1.0 gm. of neomycin containing 200 Waksman units per milligram every 12 hr. for 29 to 52 days. The most important toxic reaction was the development of deafness in four of the six patients during the fourth to sixth week of treatment. This progressed to almost complete deafness although treatment with neomycin was discontinued immediately. All six patients showed signs of renal damage during neomycin therapy; however, the renal function rapidly returned to normal when administration of the drug was stopped. Three of the six patients reported a decrease in cough and expectoration during the period of neomycin treatment. In one instance, the patient's cough cleared completely and she ceased to expectorate. Roentgenographic evidence of improvement was established in only one of these three. Tubercle bacilli recovered at postmortem examination from one of the kidneys of a patient who died after 41 days of treatment were found to be resistant to neomycin in a concentration of 1,024 units per cubic centimeter of culture medium. Tubercle bacilli recovered from the lungs, spleen, liver, and omentum, however, were found to be sensitive to 1.0 unit or less of neomycin per cubic centimeter of culture medium. Neomycin in sufficiently large doses is a potent antibacterial agent against the tubercle bacilli in experimental tuberculosis in animals. In the present study, suggestive indications of antimicrobial effect were observed in the one patient who received the largest daily dose (2.0 gm.) of the drug. The other five patients, who received a smaller dose of neomycin, had only symptomatic benefit and the postmortem examination in one case revealed no evidence of suppression of the disease. The toxic reactions to neomycin render the particular preparation of the drug studied of little or no clinical value in tuberculosis, even if the smaller doses used in this study were therapeutically effective. Whether the toxic reactions were due to neomycin itself or to something else in the material is not known. The recovery of neomycin-resistant tubercle bacilli from one of the kidneys of a patient after 41 days of treatment suggests that tubercle bacilli become resistant to neomycin as readily as to streptomycin.

Tuberculostatic Activity of Terramycin.—The sensitivities, in vitro, of a number of human strains of tubercle bacilli to terramycin and its salts were determined. Four to 16 γ of pure terramycin per milliliter of medium were sufficient to inhibit growth of these strains. Terramycin was found to be no more active than aureomycin against tubercle bacilli, in vitro. Terramycin is active against both streptomycin-sensitive and streptomycin-resistant strains. This suggested that terramycin might be especially effective when used in combination with streptomycin or other antituberculous agents. In *vitro studies* have shown that one-fifth to one-tenth of the amount of terramycin required for inhibition of growth significantly decreases the concentrations of streptomycin, viomycin, and aureomycin necessary for inhibition of growth. The effect on the concentration of chloramphenicol or penicillin necessary for inhibition of growth was less pronounced. No change in the amount of neomycin required for inhibition of growth was observed. Terramycin exerts a bactericidal effect only if high concentrations are used. Organisms resistant to its action emerge from otherwise sensitive strains at an exceedingly slow rate. None of the five strains of Mycobacterium tuberculosis tested showed any significant increase in resistance during 12 transfers in liquid medium that contained subinhibitory concentrations of terramycin. Studies on the chemotherapeutic action of terramycin against tuberculous infections were carried out in mice infected intracerebrally. In a rapidly progressing infection, in which the average survival time of the untreated control animals was 24 days, a dosage equivalent to 8.6 mg. of terramycin per 20-gm. mouse was sufficient to increase the average survival time to 120 days. Lower doses of the sodium salt of terramycin, equivalent to 1.1 to 2.2 mg. per day, were sufficient to cause an approximately three-fold to four-fold increase in survival time. Terramycin, in both its amphoteric form and its sodium salt, was effective in suppressing this infection. The activity of terramycin in vitro and in vivo against streptomycin-resistant strains of tubercle bacilli and its low toxicity suggest that this agent may be therapeutically valuable.

American Surgeon, Atlanta, Ga.

17:175-270 (March) 1951

Intrahepatic Cholangiojejunostomy with Partial Hepatectomy for Biliary Obstruction. E. B. Hay, G. W. Waldron and J. G. Heard.—p. 175.
*Benign Lesions of Cervix: Study of 226 Cervical Stumps. C. G. Collins, G. T. Schneider and W. J. Baggs.—p. 180.
Sacrococcygeal Teratomas: Two Case Reports. C. B. Wright.—p. 196.
Gastric Resections and Vagotomies, Morbidity and Mortality in General Hospital, Not Associated with Teaching Center. J. S. Stewart.—p. 202.
Recurrent Pancreatitis. H. D. Cogswell.—p. 209.
Hemangiosarcoma (Hemangio-Endothelioma) of Stomach. H. H. Kerr and E. A. Gould.—p. 218.
Familial Urological Diseases. A. E. Goldstein.—p. 221.
Chest Conditions Which Come Under Realm of General Surgery. A. C. Hewes.—p. 227.
Radical Breast Surgery and Local Recurrence. W. C. White.—p. 237.
Experiences in Surgical Treatment of Congenital Pulmonary Stenosis. C. B. Olim.—p. 245.
Gastrojejunocolic Fistula. J. C. Patterson, W. G. Elliott and R. B. Martin III.—p. 255.

Lesions of Cervical Stumps.—Collins and his associates analyzed a series of 226 patients who, after supravaginal hysterectomy, had symptoms arising in the cervical stump warranting its surgical excision. They did not include in this analysis patients in whom symptoms were relieved by simple cauterization. Almost one-third of the patients still had the same complaint for which the original pelvic operation had been performed. Removal of the cervix produced relief. Multiplicity of symptoms was the rule. Nearly half of 226 patients had pelvic pain; 105 had leukorrhea; 84 had bloody discharge; 72 had dyspareunia; 56 had backache; 60 had urinary discomfort, and 34 had bearing down pain. In the absence of fixed pelvic masses the ability to reproduce exactly a patient's symptoms by gentle motion of the cervix means that the cervix is the etiological factor. Production of local pain is possible in any woman if the examination is very vigorous. Cervical erosion and chronic cervicitis were present in nearly 90% of the patients. Other lesions were stenosis or stricture, empyema, epidermoid carcinoma, endometriosis, fibroids, polyps, squamous metaplasia, endocervical hyperplasia, ulceration, mucocele, and leukoplakia. There were 10 patients (4.4%) with carcinoma. When hysterectomy is indicated, total abdominal hysterectomy or vaginal hysterectomy are the procedures of choice. Supravaginal hysterectomy is *rarely indicated*. If it has been performed, the cervix should be inspected at frequent intervals. If the cervix is diseased or symptomatic, cauterization or vaginal excision of the cervix is advisable.

Annals of Surgery, Philadelphia

133:289-432 (March) 1951

*Frequency of Aspiration of Gastric Contents by Lungs During Anesthesia and Surgery. G. A. Culver, H. P. Makel and H. K. Beecher.—p. 289.
Limitations of Lumbar Sympathectomy in Far-Advanced Peripheral Sclerosis. P. A. Kirschner.—p. 293.
Transient Diabetes in Postoperative State. M. D. Pareira and J. G. Probstein.—p. 299.
Uptake of Labelled Phosphorous by Cancer of Cervix: Preliminary Report. S. H. Sturgis, E. DeMuylder and J. V. Meigs.—p. 305.
Pathologic Physiology of Congenital Megacolon. R. B. Hiatt.—p. 313.
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Rationale of Radical Mastectomy: Review. D. H. Sprong Jr. and W. F. Pollock.—p. 330.
*Clinical Experiences with Aureomycin in Surgical Infections. A. M. Rutenburg, F. B. Schweinburg and J. Fine.—p. 344.
Aureomycin as Aid in Abdominal Surgery. L. T. Wright and A. Prigot. —p. 364.
Giant Cell Tumors of Tendon Sheath Origin: Consideration of Bone Involvement and Report of Two Cases with Extensive Bone Destruction. A. G. Flechtner Jr. and R. C. Horn Jr.—p. 374.
Surgical Treatment of Varicose Veins: Survey of Methods of Treatment with Description of Intraluminary Stripping and Its Results. P. W. Fenney.—p. 386.
Glomus Tumor: Report of 20 Cases. M. Riveros and G. T. Pack. —p. 394.
Glomus Tumor of Unusual Size: Case Report. D. H. Riddell and R. S. Martin.—p. 401.
Hemorrhage from Spontaneous Rupture of Pheochromocytoma of Right Adrenal Gland: Case Report. G. E. McFarland and W. R. Bliss. —p. 404.
Ovarian Dermoid Perforating Rectum in Child: Excision by Abdominoperineal Proctosigmoidectomy. H. E. Bacon and S. W. Eisenberg. —p. 408.
Spontaneous Hemopneumothorax: Report of Case Treated by Thoracotomy. R. T. Myers, F. R. Johnston and H. H. Bradshaw.—p. 413.
Giant Benign Duodenal Ulcer: Report of Case. G. Evashwick.—p. 417.
Sacrococcygeal Teratoma: Review of Literature; Report of Case in Adult Containing Glomus. L. T. Palumbo, K. R. Cross and R. E. Paul.—p. 421.

Gastric Contents in Lungs During Anesthesia and Surgery.—Aspiration of gastric contents is a serious, often fatal accident during general anesthesia. Vomiting is only part of the problem, for silent aspiration of gastric contents by the deeply anesthetized patient is also common. The authors made studies on 300 surgical patients to determine the causes and frequency of these accidents. Four cubic centimeters of a 25% aqueous solution of Evans blue dye (T-1824) were introduced into the stomach preoperatively. As soon as the operation was over, the mouth, pharynx, larynx, trachea, and main bronchi were inspected by direct vision through laryngoscope and bronchoscope. Regurgitation (as indicated by dyed stomach contents in the pharynx) occurred in 79 of the 300 patients; 24 of these showed frank vomiting. Forty-nine patients aspirated gastric contents into the lungs. Regurgitation occurs much oftener when the patient is in the Trendelenburg or the lateral position than when he is in the horizontal supine position or the lithotomy position. Gastric tubes are protective, presumably by keeping the stomach contents low in volume. When the stomach is not empty, pressure on it by the surgeon during work in the upper abdomen may possibly force gastric contents into the pharynx. The volume of the aspirated material may produce fatal obstruction, but the irritant and infectious action of the aspirated material also may be serious. The stomach should be emptied by induced vomiting when emergency surgery must be undertaken. Even 15 or 20 hours after the onset of an emotional crisis or a painful injury the stomach may still hold whatever contents it had at the beginning of that time.

Aureomycin in Surgical Infections.—Of 263 surgical patients treated with aureomycin some received it exclusively from the beginning, others were given it after they had proved refractory to other antibiotics, and still others received it in combination with other chemotherapeutic agents. Aureomycin effectively suppressed the normal intestinal flora and gave excellent results in 67 cases in which gastrointestinal surgery was done. Alone, or in combination with penicillin, aureomycin was effective in the therapy of diffuse peritonitis due to intestinal bacteria. It produced improvement in all and cure in most patients with urinary infections, due chiefly to gram-negative bacilli, providing appropriate surgical treatment was given when indicated. It seemed to control biliary tract infections, and it served as a valuable adjunct to surgery in infections of the extremities with peripheral vascular disease. Postoperative wound infections and miscellaneous infections, including acute infections of the soft tissues, acute osteomyelitis, acute parotitis, Vincent's angina, acute hepatitis, and herpes zoster, responded to aureomycin. This drug was frequently effective in infections that had failed to respond to other antibiotics, and it was equally effective in mixed and in unimicrobial infections. The drug was administered orally, intramuscularly, or intravenously. Recently the intramuscular route has been discontinued. The toxicity of parenterally administered aureomycin is almost negligible, but some lots of the drug for oral administration continue to cause nausea, anorexia, or diarrhea. In some patients, severe proctitis or colitis developed during oral aureomycin therapy. The accompanying diarrhea was so severe that the patients' fluid and electrolyte balance became seriously impaired. In several instances the bowel was edematous, hyperirritable, and in almost continuous spasm. Stomatitis and esophagitis with dysphagia, substernal pain, and "burning" lasted several weeks in some cases.

Blood, New York

6:291-388 (April) 1951

Hemolytic Disease in Newborn Dogs. L. E. Young, R. M. Christian, D. M. Ervin and others.—p. 291.
Experimental Studies on Reticulosarcoma. A. Sakamoto.—p. 314.
Serum Anti-Proteases in Leukemias. P. M. West and B. W. Smith. —p. 330.
Comparison of Effects of 4-Amino-N^{10}-Methyl-Pteroylglutaminic Acid and 2,6-Diaminopurine upon Sensitive and Resistant Sublines of Strain of Mouse Leukemia. J. H. Burchenal, L. F. Webber, G. M. Meigs and J. L. Biedler.—p. 337.
Microspectrophotometric Determination of Desoxyribosenucleic Acid in Megaloblasts of Pernicious Anemia. E. H. Reisner Jr. and R. Korson. —p. 344.
Effects Produced by Trypsin on Certain Properties of Human Red Cell. E. Ponder.—p. 350.

Bol. Asoc. Med. Puerto Rico, Santurce

43:129-198 (March) 1951. Partial Index

*Artificial Pneumothorax Evaluation Based on Complications. J. L. Porrata-Armstrong.—p. 151.

Artificial Pneumothorax.—According to Porrata-Armstrong the use of therapeutic pneumothorax has become limited in the past few years. It is still, however, the treatment of choice in unilateral pulmonary tuberculosis with or without a small cavity of recent appearance that has not responded adequately to bedrest, either alone or combined with specific therapy. The amount of exudation and caseation in the surrounding tissues and the bronchial lesions, as shown by bronchoscopy, should be minimal. Careful management of artificial pneumothorax includes the following measures: 1. Proper spacing of refills, so that optional collapse is maintained without too much fluctuation. Too much collapse is dangerous; too little is ineffective. 2. Fluoroscopy prior to each refill. 3. Determination by manometric reading that the pneumothorax needle is in the pleural space. 4. Avoidance of positive pressures. 5. Avoidance of puncturing the underlying lung. 6. Adequate bacteriological studies, including cultures of gastric washings and of sputum. 7. Proper coordination with antituberculous therapy. 8. Abandonment of the pneumothorax at the proper time, namely, when there is persistence of a cavity after an adequate trial (two to three months), increase in size of cavity during collapse, development of large and intractable pleural effusion, and rapid obliteration of the pleural space by adhesive pleuritis.

Bulletin New York Academy of Medicine, New York

27:129-198 (March) 1951). Partial Index

Some Recent Advances in Study of Uric Acid Metabolism and Gout. A. B. Gutman.—p. 144.
Tumors of Bones and Joints. H. L. Jaffe and G. Selin.—p. 165.
Modern Treatment of Syphilis. E. W. Thomas.—p. 175.

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Present Status of Antibiotics in Bacterial Infections. M. Finland.—p. 199.
Present Status of Antibiotic Therapy in Viral and Rickettsial Disease. J. E. Smadel.—p. 221.
Advances in Treatment of Chronic Alcoholism. O. Diethelm.—p. 232.
Non-Articular Rheumatism. R. H. Freyberg.—p. 245.

Circulation, New York

3:481-640 (April) 1951

*Polyarteritis Nodosa: Correlation of Clinical and Postmortem Findings in 17 Cases. G. C. Griffith and I. L. Vural.—p. 481.
*Acute and Subacute Disseminated Lupus Erythematosus: Correlation of Clinical and Postmortem Findings in 18 Cases. G. C. Griffith and I. L. Vural.—p. 492.
Hepatic Abnormalities in Congestive Heart Failure: Needle Biopsy Studies. T. J. White, R. B. Wallace, A. M. Gnassi and others.—p. 501.
Large Thymic Tumor Simulating Pericardial Effusion. A. Bernstein, E. Klosk, F. Simon and H. A. Brodkin.—p. 508.
Anatomic Variations of Orifice of Human Coronary Sinus. H. K. Hellerstein and J. L. Orbison.—p. 514.
Pathology of Pulmonary Vascular Tree: III. Structure of Intrapulmonary Arteries in Cor Triloculare Biatriatum with Subaortic Stenosis. J. E. Edwards and W. B. Chamberlin Jr.—p. 524.
Physiologic Studies in Mitral Valvular Disease. A. Draper, R. Heimbecker, R. Daley and others.—p. 531.
Circulatory and Respiratory Effects of Adenosine Triphosphate in Man. D. F. Davies, A. L. Gropper and H. A. Schroeder.—p. 543.
Production of Prolonged Arterial Hypertension in Dogs by Chronic Stimulation of Nervous System: Exploration of Mechanism of Hypertension Accompanying Increased Intracranial Pressure. R. D. Taylor and I. H. Page.—p. 551.
Cerebral Circulation and Metabolism in Uremia. A. Heyman, J. L. Patterson Jr. and R. W. Jones Jr.—p. 558.
Electrocardiogram in Congenital Heart Disease: Preliminary Report. O. Paul, G. S. Myers and J. A. Campbell.—p. 564.
Vibrations of Low Frequency over Precordium. F. D. Johnston and D. C. Overy.—p. 579.
Observations on Electrocardiogram and Ventricular Gradient in Complete Left Bundle Branch Block. J. F. Pantridge.—p. 589.
Spatial Vectorcardiogram in Right Bundle Branch Block. J. A. Abildskov, C. E. Jackson, G. E. Burch and J. A. Cronvich.—p. 600.
Angiography. C. T. Dotter, I. Steinberg and R. P. Ball.—p. 606.

Polyarteritis Nodosa.—The clinical and pathological findings were studied in 14 men and three women between the ages of 30 and 72 with polyarteritis nodosa. It was observed that this disease occurs most commonly among men between 40 and 50. Caucasians predominated over Negroes. The authors found no close etiological relationship between allergy and polyarteritis nodosa. Eosinophilia, which was considered by some to be one of the most significant laboratory findings, occurred in only one of the 17 patients, and this patient had had bronchial asthma for many years. The authors believe that polyarteritis nodosa and hypersensitivity angiitis are two different conditions and that it is the latter that is characterized by allergic manifestations, including eosinophilia. Pain was the commonest symptom and was observed in 11 patients. Shortness of breath, due to either heart failure or nonspecific pulmonary complications, was observed as a late symptom in eight patients. Tachycardia, fever, and edema were the outstanding signs. In all 17 cases there was no consistent correlation between the clinical findings referable to the cardiovascular system and specific types of pathological changes in the organs of this system. Hypertension is one of the commonest signs of polyarteritis nodosa and was observed in 13 of the authors' patients. It may develop very late, however, and failure to diagnose polyarteritis nodosa because of the absence of hypertension will lead to error, as may the absence of eosinophilia and subcutaneous nodules. The changes in the electrocardiogram were not specific and were due to myocardial ischemia and scarring. There also was no consistent correlation between the clinical evidence of renal damage and specific types of pathological changes in the kidneys. The frequent association of glomerulonephritis and polyarteritis nodosa reported in the literature previously was confirmed. In all 13 patients with hypertension pathological renal lesions were demonstrated. Involvement of the gastrointestinal system was common, and occurred in 10 of the 17 patients, with abdominal pain, nausea, and vomiting as the most frequent symptoms. The lesions were distributed throughout the viscera. The most commonly involved organ in the abdomen was the liver. Splenomegaly was observed in only three patients. The central nervous system was examined microscopically in nine cases. Four of these showed characteristic changes in the cerebral vessels. According to this study, pulmonary involvement in polyarteritis nodosa is rare, as it was observed in only one case.

Disseminated Lupus Erythematosus.—Eighteen cases of acute and subacute disseminated lupus erythematosus were verified by postmortem study in a series of 19,242 autopsies. The disease was observed to be commoner among women between the ages of 22 and 33. Pain in the joints was the commonest symptom and was observed in 13 of the 18 cases. The typical butterfly rash occurred in 11 cases. Nonspecific skin lesions were observed in four other cases. Shortness of breath was the commonest complaint and occurred in 16 cases. In 14 of these there was an alteration of the connective tissue and muscle fibers in the myocardium, but there was no constant correlation between clinical findings and specific pathological lesions. Neither murmurs heard over the precordium nor QRS and T wave changes seen in the electrocardiogram were pathognomonic for the disease. Of seven patients with apical systolic murmurs only two had nonbacterial verrucous endocarditis of the mitral valve leaflets; conversely, of six patients with nonbacterial verrucous endocarditis only two had an apical systolic murmur. Albuminuria was the commonest laboratory observation, being observed in 14 of 17 patients in whom urinalysis was performed. The often observed wire-loop changes of the glomeruli may cause albuminuria, leukocyturia, cylinduria, high nonprotein nitrogen of the blood, and hypertension collectively, or one of these signs separately, or there may be no clinical findings. In the absence of the typical butterfly rash in seven cases, the observations most constant and suggestive of the disease were (1) polyarthralgia of undetermined origin, (2) fever and tachycardia of unknown cause, (3) albuminuria alone or together with hematuria, and cylindruria, (4) leukopenia, and (5) signs and symptoms of serosal inflammation. The clinical diagnosis is confirmed by biopsy of the skin lesion, the observation of anemia and leukopenia, a high globulin content in the serum (above 2.5 gm. per 100 cc.), and the detection of typical L. E. cells in the peripheral blood or in the bone marrow.

Electroencephalography and Clin. Neurophys., Boston

3:1-130 (Feb.) 1951

Stimulation Studies of Prefrontal Lobe and Uncus in Man. W. T. Liberson, W. B. Scoville and R. H. Dunsmore.—p. 1.
Electroencephalographic Findings in 186 Cases of Chronic Post-Traumatic Encephalopathy. E. C. Clark and E. O. Harper.—p. 9.
Incidence of Focal and Non-Focal EEG Abnormalities in Clinical Epilepsy. J. Kershman, J. Vasquez and S. Goldstein.—p. 15.
Servo-Motor Integration of Electrical Activity of Brain and Its Applications to Automatic Control of Narcosis. M. Verzeano.—p. 25.
Drug Effects on Results of Minimal Cortical Stimulation. J. A. Whieldon and A. van Harreveld.—p. 31.
Physiological Relationships Between Hypothalamus and Cerebral Cortex. W. R. Ingram, J. R. Knott, M. D. Wheatley and T. D. Summers.—p. 37.
Electroencephalographic Findings in 39 Surgically Proven Subdural Hematoma. W. J. Friedlander.—p. 59.
Effect of Benzedrine on Post-Electroshock EEG. M. A. Lennox, T. C. Ruch and B. Guterman.—p. 63.
Comparative Effectiveness of Sleep and Metrazol-Activated Electroencephalography. J. K. Merlis, C. Grossman and G. F. Henriksen.—p. 71.

Illinois Medical Journal, Chicago

99:165-228 (April) 1951

Diagnosis and Treatment of Unusual Conditions in Infants and Children. J. L. Reichert.—p. 197.
Diabetes Mellitus in Infants and Children. A. L. Newcomb.—p. 204.
Urological Problems in Infants and Children. K. E. Barber.—p. 207.
New (Sublingual) Method for Controlling Pain of Migraine and Other Headaches (Preliminary Report). L. Unger and A. H. Unger.—p. 210.
Electrocardiographic Abnormalities in the Mentally Ill: Is "Myocardial Damage" Sometimes of Psychogenic Origin? S. G. Plice and C. W. Pfister.—p. 212.
Sarcoidosis. R. Bloch.—p. 218.
Carcinoma of Breast Masked by Non-Puerperal Abscess. E. F. Dolehide and J. W. Tope.—p. 220.

Iowa State Medical Society Journal, Des Moines

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Medical Care of Children with Paroxysmal Convulsive Disorders. J. C. MacQueen.—p. 111.
Discussion of Neurological Basis for Seizures. W. R. Ingram.—p. 114.
Electroencephalography in Evaluation of Epilepsy: Some Applications and Limiting Conditions. J. R. Knott.—p. 120.
Brief Survey of Pharmacology of Antiepileptic Drugs. F. W. Schueler and R. M. Featherston.—p. 125.
Neurosurgical Measures in Management of "Epilepsy." R. Meyers.—p. 128.
Surgical Lesions of Chest in Children. J. L. Ehrenhaft.—p. 136.

Journal of Clinical Investigation, Cincinnati

30:237-344 (March) 1951

Effects of Adrenocorticotropic Hormone and Cortisone in Adrenogenital Syndrome Associated with Congenital Adrenal Hyperplasia: Attempt to Explain and Correct Its Disordered Hormonal Pattern. F. C. Bartter, F. Albright, A. P. Forbes and others.—p. 237.

Labile Factor of Prothrombin Conversion: Its Consumption Under Normal and Pathological Conditions Affecting Blood Coagulation. B. Alexander, R. Goldstein and G. Landwehr.—p. 252.

Absorption Studies Using Portal Anastomotic Veins. W. B. Bean, M. Franklin, J. F. Embick and K. Daum.—p. 263.

*Effect of Cortisone on Acute Streptococcal Infections and Post-Streptococcal Complications. E. O. Hahn, H. B. Houser, C. H. Rammelkamp Jr. and others.—p. 274.

Mechanism of Polyuria of Diabetes Insipidus in Man: Effect of Osmotic Loading. W. A. Brodsky and S. Rapoport.—p. 282.

Factors Maintaining Cerebral Circulation During Gravitational Stress. J. P. Henry, O. H. Gauer, S. S. Kety and K. Kramer.—p. 292.

Correlation of 24-Hour Radioiodine Uptake of Human Thyroid Gland with Six- and Eight-Hour Uptakes and "Accumulation Gradient." M. A. Greer.—p. 301.

Effect of Upright Posture upon Hepatic Blood Flow in Normotensive and Hypertensive Subjects. J. W. Culbertson, R. W. Wilkins, F. J. Ingelfinger and S. E. Bradley.—p. 305.

Effect of Splanchnic Sympathectomy in Hypertensive Patients upon Estimated Hepatic Blood Flow in Upright as Contrasted with Horizontal Position. R. W. Wilkins, J. W. Culbertson and F. J. Ingelfinger. —p. 312.

Adrenocortical Control of Sodium and Potassium Excretion in the Newborn Period. R. Klein.—p. 318.

Studies on Combined Use of Measurements of Sweat Electrolyte Composition and Rate of Sweating as Index of Adrenal Cortical Activity. W. Locke, N. B. Talbot, H. S. Jones and J. Worcester.—p. 325.

Effect of Lipiodol on Alveolar Gas Exchange. H. Black and A. Roos. —p. 338.

Cortisone and Acute Streptococcic Infections.—The authors studied 174 patients with acute streptococcic tonsillitis and pharyngitis to determine the effect of cortisone on the disease and on the subsequent incidence of rheumatic fever. The patients were divided into treated and control groups. Two treatment schedules were employed. Seventeen patients received a total of 500 mg. of cortisone acetate intramuscularly in 50 mg. doses. Seventy patients were given a total of 600 mg. in 100 mg. doses. Control patients received 0.85% sodium chloride injections. No antipyretics or other medications were given, except codeine for relief of severe headache. Patients were examined daily through the sixth day of illness by one member of the staff who had no knowledge of the treatment being administered. Cortisone therapy had no effect on symptoms or physical signs of this infection. Patients who received cortisone had fever for a longer period than the control patients. Suppurative complications developed in one of the treated patients and in three of the control subjects. Rheumatic fever was diagnosed in two treated and five control subjects. The increase in the antistreptolysin titer was somewhat less in the serums of the treated group than in the control patients one week after the onset of infection, but at two, three, and four weeks the formation of antibody was slightly greater in treated than in control patients.

Journal of Investigative Dermatology, Baltimore

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Lack of Fluorescence of Scalp Hairs Infected with Microsporum Gypseum (Fulvum). J. W. Wilson and O. A. Plunkett.—p. 119.

Treatment of Parapsoriasis with Vitamin D^2. O. Canizares, J. H. Dwinelle and H. Shatin.—p. 121.

Experimental Treatment of Verruca Vulgaris with Locally Injected Colchicine. L. M. Nelson.—p. 123.

Electrophoretic Studies in Bullous Diseases: Electrophoretic Pattern of Animals Injected with Serum or Blister Fluid from Patients with Bullous Disease. M. H. Berg and A. C. Curtis.—p. 125.

Universal Serologic Reaction in Rabbit Syphilis. A. C. Curtis, R. J. Rowe, B. J. Baribeau and R. L. Kahn.—p. 131.

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J. National Malaria Society, Columbia, S. C.

10:1-96 (March) 1951

Malaria and Society. P. F. Russell.—p. 1.

Preliminary Experiments in Use of Hot DDT and Other Halogenated Hydrocarbons for Residual Applications. R. L. Crowell and R. W. Fay. —p. 8.

Growth Changes of Anopheline Eggs in Water and in Saline Solutions. W. G. Downs.—p. 17.

Characteristics of Larvicidal Sprays Applied by Aircraft for Control of Anopheles Quadrimaculatus on Impounded Water. C. W. Kruse, E. A. Philen and G. F. Ludvik.—p. 23.

Susceptibility of Anopheles Quadrimaculatus to DDT After Five Years of Routine Treatment in the Tennessee River Valley. G. F. Ludvik, W. E. Snow and W. B. Hawkins.—p. 35.

Malaria Reconnaissance in the Dominican Republic. T. T. Mackie, T. W. Simpson and R. L. Tuttle.—p. 44.

Observations on Natural Occurrence of Plasmodium Floridense, Saurian Malaria Parasite, in Sceloporus Undulatus Undulatus. M. H. Goodwin Jr.—p. 57.

Strain Differences in Plasmodium Gallinaceum Brumpt: II. Experiences with Sporozoite and Single Oocyst Passage of BI Strain. H. L. Trembley, J. Greenberg and G. R. Coatney.—p. 68.

Id.: III. Spontaneous Conversion of Phanerozoite-Producing SP Strain to Phanerozoiteless M Strain Through Mosquito Passage. H. L. Trembley, J. Greenberg and G. R. Coatney.—p. 76.

Id.: IV. Experiences with Blood Passage of Phanerozoiteless M Strain. J. Greenberg, H. L. Trembley and G. R. Coatney.—p. 82.

J. Neuropath. and Clinical Neurology, Chicago

1:111-182 (April) 1951

Cauda Equina Nerve Root Regeneration Through Nerve Grafts: Experimental Study in Monkeys. I. M. Tarlov, D. Berman, E. Kellerman and J. Moldaver.—p. 111.

*Encephalopathy Following Barbiturate Intoxication: Report of Case. M. A. Neumann.—p. 145.

"Circumscribed" Glioblastoma Multiforme. L. M. Davidoff and E. H. Feiring.—p. 161.

Lipoma of Corpus Callosum. M. E. Kinal, G. Rasmussen and W. B. Hamby.—p. 168.

Combined Silver and Sudan Strain for Demonstration of Senile Plaques and Lipoids in Frozen Sections. G. Strassmann.—p. 179.

Encephalopathy Following Barbiturate Intoxication.—Barbiturate poisoning is generally followed by either complete recovery without neurologic sequelae or death within the first 48 hours. The case reported here is of special interest because the patient lived in a state of semistupor for nearly five months after the ingestion of about 70 grains (4.7 gm.) of phenobarbital and 24 sedormid® (allyl-isopropyl-acetyl-carbamide) sedative tablets without fully recovering social awareness. Massive cerebral infarction and acute bronchopneumonia were regarded as the cause of death. Destructive parenchymatous lesions and progressive proliferative changes in the glia were found. The predominant changes were in the form of laminar cortical degeneration associated with less prominent basal ganglion damage. These changes are not specific, as similar lesions have occurred as the result of poisoning with carbon monoxide and other noxious agents. It is suggested that a direct chemical action of the poison on the nerve cells may be as important a factor as is anoxia in the production of the cerebral changes.

Journal of Nutrition, Philadelphia

43:345-458 (March) 1951

Influence of Animal Protein Factor Supplements and Antibiotics on Incidence and Severity of White Feathers in Turkeys. S. J. Slinger, K. M. Gartley, W. F. Pepper and D. C. Hill.—p. 345.

Studies on Chronic Oral Toxicity of Cottonseed Meal and Cottonseed Pigment Glands. A. M. Ambrose and D. J. Robbins.—p. 357.

Augmentation of Provitamin A Potency of Carotene When Fed in Margarine. H. J. Deuel Jr., S. M. Greenberg, E. E. Savage and D. Melnick. —p. 371.

Demonstration of Copper Deficiency in Young Growing Pigs. H. S. Teague and L. E. Carpenter.—p. 389.

Digestion and Absorption of P^{32} Labeled Casein by Young Calf. G. P. Lofgreen, M. Kleiber and A. H. Smith.—p. 401.

Thiamine Deficiency in Lamb. H. H. Draper and B. C. Johnson.—p. 413.

Supplemental Value of Certain Amino Acids for Lamb Protein and Nutritive Value of Protein in Different Cuts of Lamb. R. Hoagland, N. R. Ellis, O. G. Hankins and others.—p. 423.

Effect of Heat Treatment on Nutritional Value of Some Vegetable Oils. E. W. Crampton, F. A. Farmer and F. M. Berryhill.—p. 431.

Nutrition of Mouse: X. Studies on Utilization of High and Moderately Low Protein Diets for Growth in Four Strains of Mice. P. F. Fenton and C. J. Carr.—p. 441.

Vitamin A and Carotene Absorption in Guinea Pig. L. Woytkiw and N. C. Esselbaugh.—p. 451.

Journal of Pediatrics, St. Louis

38:275-410 (March) 1951

Pediatrician Looks at Psychiatry. L. Porter.—p. 275.
*Treatment of Epilepsy by Cortical Excision. A. E. Walker.—p. 285.
Determination of Sodium 24 "Space" in Infants, Children and Adults. A. Perley, G. B. Forbes and M. M. Pennoyer.—p. 299.
*Illness in First Trimester of Pregnancy: Its Lack of Significance in Relation to Congenital Anomaly of Offspring and to Full-Term Pregnancy, Prematurity, and Stillbirth. E. E. Hartman and R. L. J. Kennedy. —p. 306.
Erythema Multiforme Exudativum. L. Wright and S. Jenkins.—p. 310.
Erythema Multiforme as Manifestation of Neonatal Septicemia. H. J. Starr and P. B. Holliday Jr.—p. 315.
Ileocecal Intussusception Caused by Lymphoid Hyperplasia. W. D. O'Sullivan and C. G. Child III.—p. 320.
Precocious Sexual Development: Study of 30 Cases. G. H. Lowrey and T. G. Brown.—p. 325.
Clinical Study in Man of Effects of Variation of Agenized Flour Products in Diet. M. W. Laufer, E. Denhoff and F. Giunta.—p. 341.
Acute Glomerulonephritis: Impetigo as Etiological Factor. G. C. McCullough, J. Y. Coffee, P. A. Trice Jr. and others.—p. 346.
Survey of the Rh Problem in Mixed Racial Group. H. H. Pomerance and L. J. Salerno.—p. 349.
Aortic Atresia with Hypoplasia of Left Heart and Aortic Arch. S. Friedman, L. Murphy and R. Ash.—p. 354.

Treatment of Epilepsy by Cortical Excision.—Primary therapy for a patient suffering from convulsive seizures consists of anticonvulsive medication, psychotherapy, and social and occupational rehabilitation. Operative intervention should be considered when medical management has failed to control the seizures. If there is evidence of a progressive lesion of the brain, such as tumor, abscess, or hematoma, appropriate surgical measures are imperative. Thus only 20 to 25% of patients with focal epilepsy become candidates for surgical intervention. The focal nature of an epilepsy may be suggested by the clinical history, the electroencephalogram, pneumoencephalogram, and angiogram but must be established by critical examination of the entire clinical picture together with the results of the various diagnostic tests. If a discrepancy between these various examinations becomes apparent, it should be considered that two foci exist or that the condition is idiopathic rather than focal epilepsy. Three cases of focal epilepsy, in boys 15, 12, and 11, respectively, are reported on, illustrating the various types of cortical resections for this condition. Subpial resection was adequate and should produce minimal scarring in the first case. The epileptogenic zone involved a large area at the occipital pole in the second case, requiring partial occipital lobectomy. In the third patient, with infantile hemiplegia, hemispherectomy was necessary to eliminate the abnormal, scarred tissue. The end results of surgical treatment cannot be assessed accurately until the patients have been followed for at least five years, but the physical and mental improvement that followed the surgical resection of epileptogenic foci in isolated cases offers much promise to a group of patients with focal epilepsy otherwise considered incurable.

Illness in First Trimester of Pregnancy.—Of 1,228 mothers who gave birth to 1,237 infants in 1948 at St. Mary's Hospital in Rochester, Minn., 148 mothers were ill at some time in the first trimester of pregnancy. These ill mothers subsequently gave birth to 149 children, eight of whom (5.4%) had congenital anomalies. The 1,080 mothers who were not ill in the first trimester of pregnancy gave birth to 1,088 infants of whom 57 (5.2%) had congenital anomalies. Thus, there was no significant difference between the incidence of congenital anomalies following maternal illness in the first trimester of pregnancy and that following uneventful pregnancy. Furthermore, illness in the mother in the first trimester of pregnancy apparently was not significant in the incidence of full-term pregnancy, prematurity, or stillbirth.

J. Venereal Disease Information, Washington, D. C.

32:57-82 (March) 1951

Effect of Syphilis on Nonwhite Longevity as Reflected in Mortality Data, Georgia, 1939-41. H. W. Martin.—p. 57.
Venereal Disease Case Finding in High-Prevalence Areas: I. Procedures Used. G. Gumpert, N. R. Ingraham Jr. and M. J. Burke.—p. 60.
*Dental Hypoplasias in Relation to Congenital Syphilis. S. B. Beecher, H. N. McIntosh and E. J. McCart.—p. 70.

Dental Hypoplasias in Congenital Syphilis.—The authors made a survey in 18 public schools for Negroes in Missouri to determine the incidence of congenital syphilis in children with dental hypoplasias suggestive of syphilis. The syphilitic hypoplasias that affect the permanent incisors and six year molars are known as Hutchinson's incisors, mulberry molars, and the bud molar of Pfluger. The public health dentist examined 1,639 children. Each child who was a suspect and the child's mother were called so that the family's medical history and serologic tests for syphilis could be taken. The family of each seropositive child was examined by the medical officer. Of 54 suspects reported by the dentist, 50 were serologically tested for syphilis and 16 were found to be infected with congenital syphilis. The results of this project indicate that the cooperation of dentists would be of practical value in case finding. The venereal disease investigator could expect to find 25% of the suspected patients infected with congenital syphilis.

Kansas Medical Society Journal, Topeka

52:93-156 (March) 1951

Trochanteric Fractures of Femur: Experiences at the University of Kansas Medical Center with Group of 45 Cases Treated by Non-Operative Methods During Past Five Years. E. T. Haslam and W. D. Francisco. —p. 93.
Effects of ACTH on Liver Function. R. E. Bolinger and M. H. Delp. —p. 99.
Reversible Cerebral Atrophy. W. P. Williamson and C. J. Winter. —p. 107.
Prolapsing Redundant Gastric Mucosa. G. M. Tice and T. G. Orr. —p. 110.
Re-Evaluation of Surgical Treatment for Duodenal Ulcer as Based on Experimental and Clinical Observations. S. R. Friesen.—p. 114.
Inhibition by Antihistaminic Compounds of Growth of Pathogenic Fungi: Effect of Chlor-Trimeton Maleate in Vitro. J. S. Carter and R. L. Sutton Jr.—p. 119.
Treatment of Congestive Failure. E. G. Dimond.—p. 120.

Nebraska State Medical Journal, Lincoln

36:81-112 (March) 1951

Management of Causalgia. L. G. Herrmann.—p. 82.
Endometriosis. C. P. Huber.—p. 87.
The Goiter Problem Today. H. H. Davis.—p. 91.
Proctoscopy for the Physician. J. B. Christensen.—p. 95.
Management of Blood Bank. F. Cole.—p. 97.
Infectious Diarrheas: Some Bacteriological and Epidemiological Aspects. H. W. McFadden Jr. and M. F. Gunderson.—p. 100.

New England Journal of Medicine, Boston

244:385-422 (March 15) 1951

Effect on Endogenous Thyroid Activity of Feeding Desiccated Thyroid to Normal Human Subjects. M. A. Greer.—p. 385.
Newer Antibiotics in Treatment of Anthrax. H. Gold and W. P. Boger. —p. 391.
Thyroid Crisis Associated with Diabetic Coma. P. Troen, R. C. Taymor and B. I. Goldberg.—p. 394.
Pharyngeal and Laryngeal Symptoms of Thyroid Origin. R. T. Barton. —p. 398.
Medicine as Science: Neurology. H. R. Viets.—p. 400.

244:423-458 (March 22) 1951

Physiologic Principles in Management of Dermatitis. D. M. Pillsbury. —p. 423.
Pulmonary Adenomatosis: Report of Two Cases. E. W. Peterson and J. D. Houghton.—p. 429.
Calcareous Tendinitis of Flexor Carpi Ulnaris. A. P. Aitken and H. K. Magill.—p. 434.
Deep Subcutaneous Administration of Concentrated Heparin: Observations on 15 Patients. D. V. Baker Jr., R. Warren and J. S. Belko. —p. 436.
Medicine as Social Instrument: Nursing. E. K. Russell.—p. 439.

244:459-494 (March 29) 1951

Mercuric Bichloride Poisoning. P. Troen, S. A. Kaufman and K. H. Katz. —p. 459.
Role of Adrenal Steroids in Infection and Immunity. E. H. Kass and M. Finland.—p. 464.
*Extract of Licorice for Treatment of Addison's Disease. J. Groen, H. Pelser, A. F. Willebrands and C. E. Kamminga.—p. 471.
*Eventration of Diaphragm Repaired With Tantalum Mesh. D. T. Monahan.—p. 475.
Medicine as Science: Pathology. O. T. Bailey.—p. 478.

Licorice in Addison's Disease.—Borst recently demonstrated that glycyrrhiza (licorice) extract causes sodium retention and potassium loss leading to an increase in extracellular fluid, plasma volume, venous pressure, and pulse pressure. He concluded that glycyrrhiza contains a substance with desoxycorticosterone-like action. Groen and co-workers then administered 15 gm. of glycyrrhiza extract per day to a patient with Addison's disease previously controlled with desoxycorticosterone acetate. Mineral equilibrium was maintained as long as the glycyrrhiza therapy was continued. Withdrawal of the extract was followed by reappearance of the clinical, biochemical, and hemodynamic disturbances. A second course, of 30 gm. daily, again produced clinical and laboratory remission. In another patient with Addison's disease a crude extract of one of the main ingredients of the extract, ammonium glycyrrhizinate (3.3 gm. daily orally), maintained sodium, potassium, and chloride equilibrium. Glycyrrhizonic acid is a component of glucuronic acid and glycyrrhetinic acid. The latter is a polyterpene with a structural formula exhibiting a striking resemblance to the cyclopentenophenanthrene steroids, to which group desoxycorticosterone belongs.

Tantalum Mesh in Eventration of Diaphragm.—Monahan reports a case of eventration of the right leaf of the diaphragm associated with massive hemorrhage from a duodenal ulcer. The patient was explored thoracically, and the diaphragm was pleated and reinforced with tantalum mesh. Subsequent bleeding necessitated an emergency gastric resection. Roentgenograms taken 15 months after operation showed the repair to be intact and the diaphragm remaining in its new position. It may be concluded that tantalum mesh can be placed next to the lung without harmful effects and with no more effusion than one would expect to occur after an exploratory thoracotomy.

New York State Journal of Medicine, New York

51:689-816 (March 15) 1951

Role of Physician's Personality in Medical Practice (Psychotherapeutic Medicine). B. V. Strauss.—p. 753.
Classification of Forceps Injuries. E. M. Greenberg.—p. 757.
Cation Exchanger in Hypertension. D. N. Groff.—p. 758.
Friedländer's Bacillus Meningitis in Case with Liver Abscess and Recurrent Bacteremia and Analysis of Cases Receiving Specific Therapy. S. E. Di Figlia and C. Cramer.—p. 761.
Simplified Technic and Guide for Internal Fixation of Fractures About Neck of Femur. T. J. O'Kane and J. J. Leichtling.—p. 766.
Sickle Cell Anemia in Pregnancy. M. Seife and C. Reich.—p. 769.

Pediatrics, Springfield, Ill.

7:305-456 (March) 1951

Effects of Large Loads of Electrolytes. J. L. Gamble, W. M. Wallace, L. Eliel and others.—p. 305.
Total Body Water in Children. B. J. Friis-Hansen, M. Holiday, T. Stapleton and W. M. Wallace.—p. 321.
Effect of Dehydration Produced by Water Deprivation, Diarrhea and Vomiting on Renal Function in Infants. P. L. Calcagno and M. I. Rubin.—p. 328.
Observations on 26 Infants Under One Year of Age Operated on for Tetralogy of Fallot or Tricuspid Atresia. C. R. Leininger and S. Gibson.—p. 341.
Acute Purulent Arthritis (B. Pyocyaneus) in Premature Infant: Recovery with Streptomycin. J. M. Coleman and F. C. Lowry.—p. 347.
Terramycin Hydrochloride in Treatment of Salmonella Choleraesuis Bacteremia. R. B. Scott and C. H. Wooding Jr.—p. 349.
Diplococcus Crassus Septicemia in Premature Infant. H. M. Cardullo, I. Schulman and F. C. Smith.—p. 355.
Spirometric Measurements of Lung Function in Healthy Children. J. A. Turner and R. L. McLean.—p. 360.
*Vitamin A Poisoning. D. Gribetz. S. H. Silverman and A. E. Sobel. —p. 372.
Vitamin E Blood Levels in Premature and Full Term Infants. S. W. Wright, L. J. Filer Jr. and K. E. Mason.—p. 386.
Pulmonocardiac Failure: Report of Case. W. F. O'Connell and Y. C. Lee.—p. 394.
T Wave Contour in Precordial Leads During Childhood. R. W. Reynolds. —p. 400.
Circulating Eosinophils in Children in Health and Disease. K. Hain. —p. 408.
*Gastrointestinal Lesions in Acute Bulbar Poliomyelitis: Report of Five Cases with Recovery in One. C. D. Cook, J. R. Hartmann, S. J. Sarnoff and W. Berenberg.—p. 415.
Electroencephalogram and Eye Disorders: Clinical Correlation. J. D. Levinson, E. L. Gibbs, M. L. Stillerman and M. A. Perlstein.—p. 422.

Vitamin A Poisoning.—The occurrence of hypervitaminosis A is reported in two children, a boy 2½ years and a girl 17 months. A survey of the literature revealed records of only 14 cases, all in infants and children, with symptoms of overdosage with vitamin A. The authors' first patient was admitted to the hospital because of irritability, failure to walk, and roentgenologic evidence of cortical thickening of bone suggesting scurvy or leukemia. He also had lesions around the mouth resembling those of vitamin B complex deficiency. A survey of the child's vitamin status in general was undertaken and an elevated fasting vitamin A level of 837 γ per 100 cc. was found. History revealed excessive vitamin A intake. The fasting vitamin A level two days later was 695 γ per 100 cc., of which 67.3% was in the alcoholic form. This elevated level of alcoholic vitamin A, probably denoting large stores of vitamin A in the liver, appears to be a better index of hypervitaminosis A than the total vitamin A level. In addition, evidence has been presented that the toxic factor in hypervitaminosis A is the persistently elevated plasma vitamin A level. The authors' second patient had a history of excess vitamin A intake and the characteristic clinical and roentgenograpihc findings. The symptoms disappeared after cessation of high vitamin A intake. It is suggested that excess intake of vitamin A causes saturation of the tissues, which leads to pathological changes involving the epiphyseal and appositional bone growth, which consist of increased density of the epiphyseal lines and cortical thickening. Cortical thickening apparently causes the tenderness of the extremities that was seen clinically. It cannot be emphasized too strongly that excess vitamin intake may be as dangerous as a deficient intake.

Gastrointestinal Lesions in Bulbar Poliomyelitis.—Five children, between the ages of 3 and 11 with severe bulbar poliomyelitis complicated by gastrointestinal perforation and/or hemorrhage are reported on. Four of the patients died. The gastrointestinal lesions were associated with respiratory center involvement in all the patients. The electrophrenic respirator was instrumental in maintaining the respiration of the surviving patient. Massive blood transfusions given to this patient prevented shock from intestinal hemorrhage. The gastrointestinal complications of bulbar poliomyelitis appear to be more frequent than previously realized. A relationship between midbrain damage and gastrointestinal lesions, as emphasized by Cushing, occurring during the course of acute bulbar poliomyelitis, is postulated. Routine guaiac tests should be performed on the stools of all patients with acute bulbar poliomyelitis, so that the presence of gastrointestinal bleeding may be recognized as early as possible. Therapy for these desperately ill patients should include blood transfusions since, as demonstrated by the authors' surviving patient, this condition can be controlled.

Plastic and Reconstructive Surgery, Baltimore

7:169-262 (March) 1951

Guide and Bibliography for Research into Skin Homograft Problem. B. O. Rogers.—p. 169.
Pharyngeal Flap Operation as Speech Aid. R. E. Moran.—p. 202.
Combined Use of Push-Back and Pharyngeal Flap Procedures in Management of Complicated Cases of Cleft Palate. H. Conway.—p. 214.
Free Pattern Skin Graft in Total Scalp Avulsion. S. K. Wynn.—p. 225.
Scalp Defects and Their Repair. K. M. Marcks, A. E. Trevaskis and T. J. Nauss.—p. 237.
Vitallium Reconstruction of Hemimandible and Temporo-Mandibular Joint. W. P. Kleitsch.—p. 244.

Public Health Reports, Washington, D. C.

66:327-354 (March 16) 1951

Studies to Formulate New Media for Standard Plate Count of Dairy Products. L. Buchbinder, Y. Baris, E. Alff and others.—p. 327.
Incidence and Distribution of Brucella abortus in Slaughtered Bang's Reactor Cattle. N. B. McCullough, C. W. Eisele and A. F. Byrne. —p. 341.
Charcoal Agar Culture Medium for Preparing Hemophilus Pertussis Vaccine. H. M. Powell, C. G. Culbertson and P. W. Ensminger. —p. 346.

66:355-386 (March 23) 1951

Statistical Studies of Heart Disease: IX. Race and Sex Differences in Trend of Mortality from Major Cardiovascular-Renal Diseases. I. M. Moriyama and T. D. Woolsey.—p. 355.
Graduates from Undergraduate Sanitary Engineering Courses in the United States. A. P. Miller.—p. 369.
*Hazards of Shoe-Fitting Fluoroscopes. W. W. Van Allen.—p. 375.

Hazards of Shoe-Fitting Fluoroscopes.—Shoe-fitting fluoroscopes present two distinct radiation problems: (1) the direct radiation received by the customer, and (2) the radiation received by the shoe store personnel. In the first case, radiation exposure is brief but relatively intense. Conversely, clerks and other personnel in the store are subject principally to secondary radiation in varying quantities, depending on their position and habits during examinations. The author of this report examined several shoe-fitting fluoroscopes and measured their radiation characteristics. Considering the very short target-foot distance in these machines, amounting to approximately 6 in. (15.24 cm.), high dosage rates are to be expected. The secondary radiation, immediately behind the customer, may be as much as 50 to 100 milliroentgens per minute. Since the maximum permissible radiation dosage rate is defined as 300 milliroentgens per week, it is clear that this safety limit could easily be exceeded by a clerk who regularly stands in this region. Measures for reducing the radiation hazards inherent in shoe-fitting fluoroscopes are discussed. It is important that shoe store operators be educated about the x-ray equipment that they use in their business. Unfortunately, there is no way to prevent customers from going from one store to another and receiving one or more exposures in each. The city of New York requires the display of warning cards advising against more than three exposures a day, or 12 per year. It should be noted, however, that this limit of three exposures per day is predicated on a maximum radiation dosage of 2 r, which is much lower than any of the dosages actually encountered in a survey.

Southern Medical Journal, Birmingham, Ala.

44:275-368 (April) 1951

Intubated Ureterotomy. D. M. Davis.—p. 275.
Treatment of Female Urethral Diverticula. R. B. Carson and W. D. Wells.—p. 285.
Fatigue Fractures of Tibia. R. P. Kelly and F. E. Murphy.—p. 290.
Enhancement of Serum Penicillin Levels in Man by Benemid.® M. Meads, V. H. Knight and H. L. Izlar Jr.—p. 297.
The Cardiac Patient as a Surgical Risk. W. K. Purks and N. Chalmers.—p. 303.
Prevention of Postoperative Complications. H. C. Ilgenfritz.—p. 306.
Employability of Men After Acute Myocardial Infarction: Ultimate Prognosis of 344 Men Who Returned to Work. M. M. Weiss and W. R. Gary.—p. 312.
Ocular Complications of Arthritis. D. Vail.—p. 317.
Some Unusual Manifestations of Pancreatitis. W. M. Johnson.—p. 322.
•Postoperative Physiologic and Clinical Study of Gastric Vagotomy in 130 Cases. W. Walters and H. H. Belding III.—p. 326.
Practical Histochemical Methods for Tissue Pathology. J. F. A. McManus.—p. 337.
Detection of Industrial Dermatoses. P. C. Campbell Jr.—p. 340.
Industrial Hygiene in Public Health Program. H. H. Hudson.—p. 342.
The Common Cold: What to Do About It. L. M. Sellers.—p. 345.
Management of Pertussis. R. W. Blumberg.—p. 350.
Thrombocytopenia of the Newborn. R. J. LaDriere.—p. 355.
Diagnosis and Treatment of Meconium Peritonitis. C. R. Doyle.—p. 358.

Postoperative Study of Vagotomy.—From a follow-up study of 130 patients on whom vagotomy was performed for peptic ulcer, Walters and Belding reached the following conclusions: 1. Vagotomy is not indicated in the treatment of gastric ulceration, the procedure of choice being gastric resection. 2. Vagotomy alone is rarely indicated in the treatment of duodenal ulceration, and it adds little to such simultaneously performed procedures as gastric resection and gastroenterostomy in the prevention of recurrent ulceration. In addition it has increased the postoperative morbidity and mortality. 3. Vagotomy is an extremely valuable operation in cases of gastrojejunal ulceration after adequate gastric resection. It is of further value combined with a second resection of the stomach for gastrojejunal ulcer, when inadequate resection has been done. 4. There is probably a place for vagotomy in the treatment of small gastrojejunal ulcers or of hemorrhagic gastrojejunitis after gastroenterostomy. In most cases, however, gastric resection is preferred. The wide variety of opinions in regard to the efficacy of the operation is probably due to the differences in the results obtained from clinical follow-up and from questionnaires, and to the failure of some observers to make objective studies one and one-half to two years postoperatively. The authors also observed that following vagotomy alone disturbances of motility persisted in 26.4% of cases studied one to four years after operation and acidity returned to preoperative levels in 23.7% of cases. The results of the insulin test correlated well with clinical results in 80% of all cases but in only 23.1% of the cases with poor clinical results, which indicates that this test is a poor prognostic index of recurrence of ulcer.

Southwestern Medicine, El Paso, Texas

32:73-108 (March) 1951

Hodgkin's Disease and Lymphoid Tumors. H. F. Hare and C. F. Sornberger.—p. 86.
Recent Advances in Proctology. H. Eidinoff.—p. 91.
Anemia. M. A. Carreras.—p. 92.

32:109-144 (April) 1951

Tinea Capitis in the El Paso Southwest. H. D. Garrett and L. M. Smith.—p. 124.
Metabolic Factor of Posterior Pituitary. T. M. Feinblatt and E. A. Ferguson Jr.—p. 127.
Intra-Arterial Transfusion in Case of Hemorrhagic Emergency. B. L. Burditt.—p. 131.

Surgery, Gynecology and Obstetrics, Chicago

92:257-384 (March) 1951

Epidural Hemorrhage and Skull of Children. J. B. Campbell and J. Cohen.—p. 257.
Acute Perforations of Stomach, Duodenum, and Jejunum: Analysis of 224 Cases with Late Follow-Up Data on 147 Cases of Acute Perforated Peptic Ulcer. F. P. Turner.—p. 281.
*Postoperative Use of Adrenal Cortical Extract. J. W. Kelso and C. Keaty.—p. 296.
Preliminary Investigation on Value of Dihydrogenated Alkaloids of Ergot in Treatment of Experimental Frostbite. L. A. Hurley, J. E. Roberts, A. R. Buchanan and G. Tillquist.—p. 303.
*Technique of Vagotomy and Gastroenterostomy in Treatment of Duodenal Ulcer. G. Crile Jr.—p. 309.
Neurovascular Mechanism of Stomach and Duodenum. H. B. Benjamin.—p. 314.
Total Colpocleisis for Pelvic Eventration. H. D. Adams.—p. 321.
Experimental Production of Interventricular Septal Defects: Certain Physiologic and Pathologic Effects. G. D. J. Griffin and H. E. Essex.—p. 325.
Diagnosis and Treatment of Ectopic Pregnancy: Analysis of 140 Recent Cases. B. Word.—p. 333.
Sacrococcygeal Teratomas in Infants and Children: Report of 40 Cases. R. E. Gross, H. W. Clatworthy Jr. and I. A. Meeker Jr.—p. 341.
Perineotomy. J. W. Huffman.—p. 355.
Comparative Study of Operations for Carcinoma of Rectum and Rectosigmoid. C. W. Mayo, M. J. Lee Jr. and R. M. Davis.—p. 360.
Parenteral Nutrition: XII. Successful Intravenous Administration of Large Quantities of Fat Emulsion to Man. E. M. Neptune Jr., R. P. Geyer, I. M. Saslaw and F. J. Stare.—p. 365.

Postoperative Use of Adrenal Cortical Extract.—During periods of extreme heat, postoperative patients frequently have a severe febrile reaction. The two noxious agents, heat and the trauma of the surgical procedure, undoubtedly act as stimuli on the adrenal cortex, and certain changes in these patients appear to be related to altered adrenal activity. It was thought that the administration of an adrenal cortical preparation containing larger amounts of the 11-oxyadrenal steroids might be of value in ameliorating the condition. Women were selected for the study, since 17-ketosteroid production in them is probably entirely of adrenal origin. Ten of the 20 unselected women, who were undergoing major pelvic surgery for gynecologic disorders, received no adrenal cortical therapy and served as controls. Treatment with adrenal cortical extract was begun 12 hours before the operation, when 20 units were given intramuscularly. An additional 40 units were given immediately before and 20 units six to eight hours after the operation. During the first two postoperative days, 40 units were administered daily in two injections of 20 units each. Thereafter, for two days, the total daily dose was 20 units. The total dose was 200 units. The benefit of these rather small doses was evidenced by the clinical course. In most instances, the patients given the medication were subjected to rather more extensive surgery, and they stood the procedure well. Comparison with untreated patients subjected to at least equal surgical trauma revealed that the postoperative course of the treated patients was more satisfactory than that of the untreated group. The sense of well-being was greatly augmented, and recovery was attained without the occurrence of urinary retention, inanition, and other possible complications.

Technique of Vagotomy and Gastroenterostomy in Duodenal Ulcer.—Crile discusses the disadvantages when either vagotomy or gastroenterostomy are used alone and then stresses the advantages of the combined use of these two methods for duodenal ulcer. Most of the so-called side effects of vagotomy are the result of gastric retention and can be avoided by a combination of vagotomy with a well placed gastroenterostomy. The gastroenterostomy should be placed at the most dependent part of the denervated stomach, so as to allow drainage by gravity. It should be posterior and antiperistaltic, parallel to the greater curvature, and as close to it as possible. The vagotomy must be complete enough to protect the vulnerable gastroenterostomy from recurrent ulceration. A technique of vagotomy is described in which the nerves are put on tension and are located by palpation.

92:385-512 (April) 1951

Traumatic Rupture of Spleen: Statistical Data on 18 Cases. P. Larghero Y and F. Giuria.—p. 385.
Internal Balance of Plasma Protein in Surgical Patients. I. M. Ariel.—p. 405.
Effect of Dramamine upon Postoperative Nausea and Vomiting: Controlled Study of 250 Consecutive Surgical Patients. A. Rubin and H. Metz-Rubin.—p. 415.
Reflux Esophagitis, Sliding Hiatal Hernia, and Anatomy of Repair. P. R. Allison.—p. 419.
Radical Groin Dissection for Carcinoma: Simplified Operative Procedure. S. N. Mendelsohn and R. D. Mansfield.—p. 432.
Resection of Rectal Mucosa, Colectomy, and Anal Ileostomy with Normal Continence. J. Devine and R. Webb.—p. 437.
Biological Predeterminism in Human Cancer. I. Macdonald.—p. 443.
Valves of External Iliac, Femoral, and Upper Third of Popliteal Veins. T. Powell and R. B. Lynn.—p. 453.
*Transposition of Colon Segment as Gastric Reservoir After Total Gastrectomy. C. M. Lee Jr.—p. 456.
Value of Free Grafts of Peritoneum or Pleura in Sealing Large Defects in Alimentary Tract of Dog. R. M. Moore and A. O. Singleton Jr.—p. 466.
Frontal Leucotomy Versus Cordotomy for Relief of Pain. J. C. White.—p. 469.
*Long Term Appraisal of Carotid Body Tumors with Remarks on Their Removal. F. H. Lahey and K. W. Warren.—p. 481.
*Posttransfusion Viral Hepatitis as Surgical Complication. L. Ginzburg, L. N. Sussman and H. Auerhan.—p. 492.

Transposition of Colon Segment as Gastric Reservoir.—Lee describes an experimental procedure for transposition of the ascending colon and terminal ileum as an artificial gastric reservoir. The transposition was performed on 19 animals. Of these, eight died in shock before adequate supportive measures were instituted. Of the remaining dogs, six succumbed to leaks due to the presence of ingested hair. Of the other five, two died from obstruction and three survived for 14 days or longer. Thus in no case of ascending colon transposition was death due to circulatory embarrassment as a result of rotation of the right colon and implantation of it in the position of the normal stomach. In three human patients the operation was performed with encouraging results. The patient was a man, 53, who had a large carcinoma involving the greater curvature and posterior surface of the stomach in the region of the spleen. The operation, including incision and closure, required five hours, and the patient received three units of whole blood. He was ambulatory on the second postoperative day. Although the new "stomach" had been in place only 14 days, peristaltic activity was good and the reservoir emptied well. While transposition of the ascending colon is the preferred procedure, a segment of transverse colon might be used in selected cases. The operation, though well tolerated in this case, is of such magnitude that it should not be undertaken as a palliative procedure. Its use should be reserved for those patients in whom there is definite hope of cure. It is hoped that further favorable experience with this operation will serve to remove one of the major objections to total gastrectomy and to increase the salvage rate in gastric carcinoma.

Carotid Body Tumors.—Carotid body tumors are relatively uncommon. Their clinical recognition is difficult, as is the selection of a proper method of treatment. They occasionally surround and fuse with the carotid arteries in such a way that the tumor can be removed only by division of these vessels. These tumors are, for the most part, benign, slowly growing, and relatively asymptomatic. There was no proved instance of malignancy in the true carotid body tumors in the 23 patients observed. There were four deaths in the group, a mortality rate of 17.4%. These occurred in the group of 20 patients in whom the carotid body tumor had been excised, giving a 20% mortality rate for resection. In six patients in whom excision of the tumor was accompanied by immediate ligation of the common, internal, and external carotid arteries the mortality rate was 50%. Since the common carotid artery alone was ligated in two additional patients as a preliminary step to excision of one carotid body tumor and one glomus jugularis respectively, a total of eight patients had ligation of the common carotid artery, with three deaths (37.5% mortality). Because of this forbiddingly high mortality rate, it is concluded that tumors of the carotid body should not be excised when this would require the ligation of the internal, external, and common carotid arteries, unless the tumors are shown by biopsy to be malignant or are enlarging intrapharyngeally so as to interfere with swallowing or cause pain.

Posttransfusion Viral Hepatitis.—Ginzburg and co-workers report 15 cases of homologous serum jaundice following the use of whole blood and review four of these cases. Failure to consider homologous serum jaundice as a cause of delayed postoperative jaundice in patients who have been given transfusions may lead to serious diagnostic and prognostic errors and to hazardous, unnecessary operative procedures. The disease itself may be very serious. In this series the symptoms of onset were relatively mild, consisting of loss of appetite, nausea, and occasionally mild vomiting and diarrhea. Jaundice was sometimes observed before the development of other symptoms. The jaundice lasted between one and three months, reaching its height at about four to six weeks. Once the jaundice subsided there was no recurrence. In five instances in which tests were performed shortly after the subsidence of jaundice, persistence of residual hepatitis was suggested by cephalin flocculation and thymol turbidity tests, which still gave positive results, but to a lesser degree than at the height of the icterus. In three instances in which these tests were repeated four months later, results had become negative. In about half the cases, moderate, smooth, nontender, palpable hepatic enlargement developed and then receded as the patient improved. Jaundice due to either cicatrization following trauma or metastatic neoplasm is almost invariably of an obstructive type, whereas that occurring in homologous serum jaundice is nonobstructive. The authors discuss differentiation of the two types. There is evidence that homologous serum jaundice is caused by a virus in the blood of the donor that is introduced directly into the bloodstream of the recipient. The presence of an undetectable carrier state constitutes a serious danger in the use of "unknown" donors. The authors conclude that blood for transfusion purposes should be supplied from donors whose background are known and whose histories are reliable. Until a laboratory test is available that can exclude carriers of the virus, the danger of transmission of this disease exists and may soon serve as a curb to the ever-increasing use of whole blood just as it did to the use of pooled plasma.

Surgery, St. Louis

29:483-642 (April) 1951

Clinical Physiology of Human Bronchi: III. Effect of Vagus Section on Cough Reflex, Bronchial Caliber, and Clearance of Bronchial Secretions. K. P. Klassen, D. R. Morton and G. M. Curtis.—p. 483.
Relation of Factor of Growth to Pathogenesis of Megacolon, Megaileum, and Megaduodenum. B. Fawcett.—p. 491.
Unusual Lesions of Rectum and Anus. M. O. Hines and J. G. Riddler.—p. 496.
Intestinal Lymph Flow Following Simple Intestinal Obstruction in Rat. D. C. Balfour Jr., J. L. Bollman and J. H. Grindlay.—p. 500.
Technique for Sampling Lymph in Unanesthetized Dogs by Means of Exteriorized Thoracic Duct-Venous Shunt. C. S. Brown and E. Hardenbergh.—p. 502.
Prolongation of Life by Employment of Parenteral Alimentation. P. Nemir Jr., H. R. Hawthorne and B. L. Lecrone.—p. 508.
Adrenal Cortex and Postoperative Gastrointestinal Secretions: Clinical Significance of These Effects. J. D. Hardy.—p. 517.
Solitary Diverticulum of Ascending Colon: Case Diagnosed Before Operation. B. M. Bosworth and F. L. Landau.—p. 523.
Spontaneous Rupture of Esophagus. D. Dunavant and E. F. Skinner.—p. 527.
Management of Familial Polyposis of Colon. R. R. Anschuetz.—p. 532.
Herniations of Cervical Intervertebral Disc and Scalenotomy. H. A. Shenkin and R. A. Groff.—p. 540.
Vertebral Manifestations of Malignant Lymphoma, Myeloid Leucemia, and Multiple Myeloma. R. Mazet Jr.—p. 545.
Tenodesis of Biceps Tendons: Preliminary Report. A. A. Michele and F. J. Krueger.—p. 555.
Experimental Arteriovenous Fistula: Histologic Changes in Small Collateral Arteries. L. H. Bosher Jr., D. E. Smith, R. A. Lemmer and I. A. Bigger.—p. 560.
Anatomic Sketches Photographed on Translite Film: Description of Visual Aid for Conferences and Lectures. M. J. Healy Jr.—p. 568.
Problem of Thyroid Carcinoma. W. H. Perloff and N. G. Schneeberg.—p. 572.

FOREIGN

Arch. "de Vecchi" Anat. Pat. e Med. Clin., Florence

15:849-1316 (Nov.) 1950. **Partial Index**

*Tuberculosis in Thyroid Adenoma. U. Frasson.—p. 1141.

Tuberculosis in Thyroid Adenoma.—Microscopic examination of thyroid adenomas removed from 72 patients in a municipal hospital revealed three cases of tuberculosis of the thyroid. The three patients showed no symptoms or signs of thyroid tuberculosis, and the glands appeared grossly normal, but microscopically they showed granulomas of the tuberculous type outside the colloid-containing cavities of the thyroid. These were readily differentiated from subacute parenchymatous thyroiditis. From the clinical course of the disease and the histopathological findings, the author concludes that thyroid tuberculosis may develop in a normal gland or in an adenoma. It does not, however, stimulate thyroid adenomas.

Australian and New Zealand J. Surgery, Sydney

20:165-244 (Feb.) 1951

Indications for Pulmonary Resection. O. T. Clagett.—p. 165.
Megalocornea and Its Surgical Complications. J. B. Hamilton.—p. 184.
Management of Carcinoma of Prostate. K. Kirkland.—p. 188.
Inversion Operation in Femoral Hernia. C. Craig.—p. 195.
Advances in Cardio-Vascular Surgery. O. T. Clagett.—p. 201.
Marion's Disease or Bladder Neck Stenosis. E. M. Nanson.—p. 215.
Pancreatic Tissue in Wall of Small Intestine. I. H. Ogilvy.—p. 224.
Desmoid Tumour of Abdominal Wall. G. H. Burnell.—p. 232.
Gumma of Lung. M. P. Susman.—p. 235.
Delayed Splenic Haemorrhage: Clinical Study. J. T. Hueston.—p. 238.

British Medical Journal, London

1:543-598 (March 17) 1951

*Syringe Needles and Mass Inoculation Technique. A. Fleming and A. C. Ogilvie.—p. 543.
Post-Gastrectomy Syndromes: Study in Applied Physiology. C. Wells and R. Welbourn.—p. 546.
Effect of Streptomycin on Vestibular Function. J. R. Bignall, J. W. Crofton and J. A. B. Thomas.—p. 554.
Variability of Sperm Count. G. C. Kennedy, N. A. Richards and P. M. F. Bishop.—p. 559.
Case of Masculinovoblastoma. W. H. H. Merivale and L. Forman. —p. 560.
Positive Coombs Reaction in Pernicious Anaemia. J. G. Selwyn and S. S. Alexander.—p. 564.
Case of Painful Swelling of Hand. G. F. Rowbotham.—p. 565.

1:599-652 (March 24) 1951

History and Development of Forensic Medicine. S. Smith.—p. 599.
Successful Breast-Feeding. F. C. Naish.—p. 607.
The Healthy Child: Its Many Disguises. I. Gordon.—p. 611.
Recurrent Syncopal Attacks from Bradycardia in Infant. J. K. Wagstaff. —p. 614.
Management of Bladder in Spinal Injuries. J. C. Ross.—p. 616.
Haemangiomata of Intestine. J. B. Heycock and P. H. Dickinson. —p. 620.
Large Ovarian Cysts. R. J. Last.—p. 622.
Century of Physicians. H. Bashford.—p. 636.

Syringe Needles and Mass Inoculation Technique.—Faulty methods of sterilization of syringes and needles in mass inoculations have been known to result in transfer of infections. Fleming and Ogilvie sought a safe substitute for the dangerous method of changing the needle between each patient. In this paper experimental evidence of the efficacy of the hot oil sterilization method of sterilizing needles is presented. Without being removed from the syringe, needles can be sterilized by immersion for 10 seconds in liquid paraffin at 130 C. or higher. If hot oil is not obtainable, immersion of the needle for 10 seconds in boiling water is effective. Oil is preferable, as the needles remain sharp for a longer time and do not rust. When multiple doses are given from one filling of the syringe there is a second problem to be considered, namely, the possibility of reflux of fluid from the body of the inoculated man into the syringe. Accidental movement of the piston of the syringe or pressure in the tissues may cause such reflux. This method is therefore dangerous, even if the needle is thoroughly sterilized. It has been shown that if only one dose is taken up into the syringe and if, after inoculation, pressure is kept up on the piston until the needle is withdrawn, there is no reflux of fluid into the syringe. This method of inoculation, combined with sterilization of the needle by 10 seconds' immersion in oil at 130 C., seems to be perfectly safe and rapid enough for mass inoculation.

Deutsche medizinische Wochenschrift, Stuttgart

76:357-388 (March 23) 1951. **Partial Index**

Infectious Mononucleosis. H. Kalk.—p. 357.
Immunity in Virus Hepatitis. E. Weller.—p. 359.
Rheumatic Interstitial Pneumonia. H. Schmidt.—p. 365.
*Injuries of Peripheral Nerves After Injections. K. Kolle.—p. 367.

Injuries of Peripheral Nerves After Injections.—Kolle believes that postinjection nerve injuries are not so rare as the scanty literature indicates. The first case he cites is that of a man in whom an irreparable paralysis developed in the region of the tibial and fibular nerves after a soluble quinine hydrochloride preparation had been injected into the flexor surface of the thigh. The patient had a severe pain, and it was later found that the injection had been made into the sciatic nerve. The patient was unable to work for several years. The middle portion of the flexor surface of the thigh is unsuitable for intramuscular injection, particularly in thin persons. The case of a patient in whom paralysis of the radial nerve developed illustrates that subcutaneous injections also may produce nerve injuries. Several cases are cited in which nerve lesions with impaired sensibility developed after intravenous injections. An anatomic illustration of the bend of the elbow shows that the danger of a nerve injury always exists when a medicament is injected into the vena basilica or the vena mediana cephalica and that, therefore, in this region injections should be made into the vena mediana basilica.

Hospital, Rio de Janeiro

39:315-448 (March) 1951. **Partial Index**

*Vitamin K in Treatment of Bacillary Dysentery. M. F. Krause.—p. 361

Vitamin K in Bacillary Dysentery.—Krause administered vitamin K to three series of adult patients with bacillary dysentery. In the first series of six patients the intramuscular injection of pure vitamin K had no effect on the disease. In the second series of four patients, the oral administration of 5 to 10 mg. of vitamin K with bile salts, four times daily, resulted in cure in three days. Still better results were obtained in the last series by the oral administration of vitamin K without bile salts. The drug was given in doses of 10 mg. every two hours for two days. Cure was obtained on the first day of the treatment. The patients were discharged from the hospital on the third day. The drug was well tolerated. The author concludes that (1) vitamin K kills Shigella disenteriae or (2) bacilli of the coli group lose in certain circumstances the capacity of producing vitamin K and that this loss results in decreased resistance of the host to S. dysenteriae, increased virulence of the organism, or actual transformation of bacilli of the coli group into virulent bacilli of the dysenteric and paradysenteric group.

Journal of Laryngology and Otology, London

65:53-132 (Feb.) 1951

*Surgery of Otosclerosis. T. Cawthorne.—p. 53.
Aural Vertigo: Account of Certain Cases Resembling Ménière's Disease. W. McKenzie.—p. 70.
Aphasia as Symptom of Otogenic Brain Abscess. A. R. Harper.—p. 89.
Tuberculous Mastoiditis Treated with Streptomycin. T. M. Banham and J. Ransome.—p. 102.

Surgical Treatment of Otosclerosis.—Cawthorne reviews the present status of the surgical treatment of otosclerosis. His technique is based on Lempert's nov-ovalis approach, in which a window is made in the anterior part of the bony external semicircular canal and adjacent ampulla. This opening is covered by a flap derived from the skin covering the anterior wall, roof, and posterior wall of the bony external meatus, continuity with the intact tympanic membrane being preserved. The fenestration operation is most likely to be successful when the otosclerotic bone is limited to the region of the oval window. Extensive spread of otosclerotic bone, either over the surface or

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An asterisk (*) before a title indicates that the article is abstracted. Single case reports and trials of new drugs are usually omitted.

into the cavities of the bony labyrinth, renders a patient unsuitable for the operation, therefore, clinical indications of such extensive growth should be carefully sought. These are alteration in the timbre of the voice, intolerance of amplification, disappearance of paracusis, reduction of bone conduction, and pink-tinged tympanic membrane. The operation should be done only by those specially trained for it, and, with a skilled operator, more than two-thirds of the patients can expect lasting improvement in hearing. For those who are unsuitable for or unwilling to face surgery, a good valve-amplified hearing aid usually improves the hearing. Surgery is only part of the management of the patient suffering from this form of deafness.

Lancet, London

1:539-596 (March 10) 1951

Some Recent Studies of Porphyrin Metabolism and Porphyria. C. J. Watson.—p. 539.
*Sensibility of Rectum and Colon: Its Role in Mechanism of Anal Continence. J. C. Goligher and E. S. R. Hughes.—p. 543.
Rapid and Simple Method of Estimating Haemoglobin. G. K. Welch and W. W. Walther.—p. 548.
*Hypotensive Action of Veriloid (Veratrum Viride): Clinical Investigation. R. Kauntze and J. Trounce.—p. 549.
Chronic Non-Tuberculous Abscess at Site of Penicillin Injections. J. Fielding and A. Norris.—p. 566.
Njovera: Endemic Syphilis of Southern Rhodesia: Comparison with Bejel. R. R. Willcox.—p. 558.
Treatment of Prolapsed Cord. L. W. Cox.—p 561.
Case of True Hermaphroditism. A. W. Capon.—p. 563.

Sensitivity of Rectum and Anal Continence.—Goligher and Hughes describe the sensations produced by distention of the rectum and distal colon. A balloon, mounted on the end of a narrow graduated rubber tube, was inserted into the rectum and the lower part of the sigmoid colon. The balloon was inflated at various levels, and the minimum pressure required to produce sensation and the patient's description of the sensation were recorded. Distention of the bowel up to 15 cm. from the anal orifice caused a sensation of fulness in the rectum, producing the urge to pass gas or feces—a rectal type of sensation. Distention above this level produced a purely abdominal sensation, referred to the suprapubic or left iliac region and simulating a gas pain or intestinal colic—a colonic type of sensation. Interruption of the nerve supply to the rectum and colon by anesthetic block or operative division showed that the colonic type of sensation is mediated by the sympathetic system and the rectal type by the parasympathetic system. Balloon distention causing rectal sensation evoked a contraction of the external sphincter ani that appeared to be partly reflex and partly voluntary. This was never produced by colonic distention. A rectal type of sensation never develops in the terminal colon after colostomy but may develop to a small degree in stumps of colon drawn into the pelvis by sphincter-saving resections. This spurious rectal sensation is unfortunately no adequate substitute for genuine rectal sensation in the maintenance of anal continence. Hence, in the performance of sphincter-saving excisions, if a good functional result is to be insured and "sensory incontinence" avoided, it is essential to preserve undamaged not only the sphincter muscles but also at least 6 cm., and preferably 8 cm. or more, of anorectal stump with its parasympathetic nerve supply.

Hypotensive Action of Veriloid.—Veriloid is a stable extract of veratrum viride biologically standardized according to its vasodepressor effect in dogs. Its three major effects are hypotension, emesis, and bradycardia. It was administered by mouth to 10 hospitalized patients (five men and five women) with hypertension and intravenously to an 11th patient. Given by injection it rapidly reduces the blood pressure, so that it should prove of value in hypertensive encephalopathy and the convulsions of puerperal eclampsia. Given orally, its absorption is difficult to control and its effect lasts a relatively short time, with the result that uniform lowering of the blood pressure is not readily obtained; but the variations can be kept at a lower level, and symptomatic relief is usually attained. The margin between therapeutic and toxic levels, where high dosage is necessary, is small. This makes the fixed arteriosclerotic type of hypertension unsuitable for treatment. Because of vagus action, veriloid is best avoided in the presence of peptic ulceration. Its main field of usefulness is in the younger patients with severe benign or malignant hypertension and possibly in those with chronic nephritis.

1:597-646 (March 17) 1951

*Infection of "Clean" Surgical Wounds by Surgeon and from Air: Work and Ventilation of Operating-Theatre. G. R. Girdlestone, R. B. Bourdillon and A. M. McFarlan.—p. 597.
Treatment of Tick-Borne Relapsing Fever: Neoarsphenamine and Other Remedies. N. F. Coghill.—p. 604.
Activity of Plasma Labile Factor in Disease. M. Stefanini.—p. 606.
*Haemophilus Influenzae Meningitis Treated with Streptomycin: Difficulties in Diagnosis. E. C. Allibone, J. D. Pickup and K. Zinnemann.—p. 610.
Nitrogen Mustard and Urethane in Treatment of Nasopharyngeal Carcinoma. F. E. Stock.—p. 612.
Sensitivity to Mercurial Diuretics: Report of Two Cases. C. A. Foster and P. F. D. Naylor.—p. 614.
Urticaria Following Adrenaline but not Noradrenaline. H. Herxheimer.—p. 615.
Lichen Striatus. H. Lee.—p. 615.
Preservation of Typhoid Vaccine. D. W. Henderson, S. Peacock and J. Richley.—p. 618.

Infection of "Clean" Surgical Wounds.—Prophylaxis of "clean" surgical wounds includes the care of the patient as a whole and of the tissues of the wound in particular, and many preventive procedures, including the good design and ventilation of the operating theater. A case is reported in which a wound became infected with a type 27 hemolytic Streptococcus, a coagulase-positive Staphylococcus, Aerobacter aerogenes, and Bacillus mesentericus after a clean operation. The source of the Streptococcus was not determined. A coagulase-positive Staphylococcus was found in the nose of the operating room nurse but the many possible reservoirs of staphylococci in the noses of the visitors and on the skin of those taking part in the operation were not investigated. A. aerogenes and B. mesentericus were isolated from an unsterilized roll of plaster wool. The application of a plaster over unsterilized materials may allow organisms to penetrate the sterile dressings. Plaster wool exposed on a trolley in the plaster room may be contaminated by organisms present in the air. It is suggested that efficient masks should be provided for all those present at operation. All plaster wool used under a plaster should be autoclaved and should be unwound and rolled loosely, so that it will be penetrated by steam. Plaster wool should not be exposed on trolleys either before or after sterilization.

Streptomycin in Hemophilus Influenzae Meningitis.—Eleven patients between the ages of 4 and 22 with Hemophilus influenzae meningitis were treated with streptomycin for one to 60 days. Only five had presenting symptoms suggesting involvement of the central nervous system. Three were thought to have gastroenteritis and two an upper respiratory infection. As a result, diagnostic lumbar puncture in these cases was delayed for five to 30 days after the onset of the illness. In three patients, a spinal block developed and death followed. Necropsy revealed that both cerebral hemispheres were almost covered, and the spinal cord was encased in tenacious pus. Seven patients recovered, and one patient became demented and blind. In all the patients the strains of H. influenzae isolated were type b. The organism was sensitive to streptomycin in a concentration of two to 10 units per cubic centimeter. In four patients the cerebrospinal fluid became sterile in 24 hours. No streptomycin-resistant strains developed in any of the patients. The levels of streptomycin in the cerebrospinal fluid 24 hours after an intrathecal injection of 20-50 mg. of streptomycin were four to 64 units per cubic centimeter. When upper respiratory infections are prevalent in children, it is not easy to detect that a feverish cold is due to a more serious infection. Still more difficult is it to revise an established diagnosis. Meningism and convulsive phenomena should be accorded the respect that their possible etiology warrants. Earlier diagnosis by lumbar puncture is essential if the results are to be improved.

Medical Journal of Australia, Sydney

1:317-352 (March 3) 1951

Intubation, Enterostomy, and Laparotomy: Their Place in Treatment of Intestinal Obstruction. C. Gale.—p. 317.
Report of Two Cases of Herpes Zoster Treated with "Chloromycetin." N. F. Babbage.—p. 339.

Medizinische Klinik, Munich

46:317-348 (March 16) 1951. **Partial Index**

Question of Metabolic Disturbances in Males with Hypogenitalism. H. Wefelscheid.—p. 322.
Clinical Observations in Course of an Epidemic of Poliomyelitis. H. Laubmann.—p. 324.
*Heredity of Diabetes Mellitus: Question of Advisability of Marriage of Diabetic Patients. H. Thöne.—p. 327.
Local Application of Penicillin in Puerperal Mastitis with Abscess Formation H. Lüffe.—p. 332.

Heredity of Diabetes Mellitus.—The question whether it is advisable for diabetic patients to marry induced Thöne to investigate the familial occurrence of diabetes mellitus in a group of 130 diabetic patients. Forty-one (31.5%) of these patients had persons with diabetes mellitus among their blood relatives. In 15 of these patients one of the parents was diabetic (nine mothers and six fathers); in three, one of the parents as well as siblings had diabetes; in six, one of the grandparents was diabetic, whereas the parents were not; in about one-fourth of the patients siblings were diabetic, and conjugal diabetes was found in two couples. When diabetes was transmitted from parents to child, it appeared at an average age of 52, whereas when a grandparent was diabetic it became manifest at an average age of 36. Patients who have diabetic siblings usually become diabetic at about the age of 46. Anteposition was quite evident; that is, even if diabetes appeared at an advanced age in the older generation it was likely to appear earlier in the later generation. A predisposition to diabetes is hereditary, but the transmission is oftener recessive than dominant. Although the likelihood of developing the disease is much greater for a child with a familial predisposition to diabetes than for one without such predisposition, the author does not believe that a diabetic person should be forbidden to marry, at any rate, not if the partner is free from metabolic disorders. If both partners have a family history of diabetes, then the likelihood of diabetes in the offspring is great.

Münchener medizinische Wochenschrift, Munich

93:449-496 (March 9) 1951. **Partial Index**

Amenorrhea. G. Döderlein.—p. 449.
Depot (Slow Acting) Female Hormone Preparations in Gynecology. L. Nürnberger.—p. 453.
*Treatment of Anemia with Cobalt Compounds. H. Wolff and S. Barthel.—p. 467.

Treatment of Anemia with Cobalt Compounds.—Wolff and Barthel studied several cobalt compounds for their hematopoietic effects, possible secondary effects, and dosage in human anemia. Of 81 patients with various forms of anemia they treated 36 with intravenous injections of water-soluble cobalt chloride and 40 with intramuscular injections of an amino acid complex of cobalt. The intravenous injection of water-soluble cobalt had undesirable secondary effects in some patients, whereas the amino acid complex of cobalt was tolerated without such reactions. The latter complex is thus the preparation of choice. The reaction to dosage was tested by administration of 2.5 mg. of cobalt on the first day and 5 mg. on the second day. Thereafter, sensitive persons were given once or twice daily 2.5 mg. of cobalt, while persons with normal reactivity were given 5 to 10 mg. once or twice daily. Undesirable secondary effects were thus avoided, and treatment could be continued for the required period of 10 to 30 days. The small doses of cobalt exerted a decided erythropoietic stimulus. With the exception of pernicious anemia and macrocytic anemia, cobalt therapy is effective in almost all forms of anemia, particularly in those forms in which the bone marrow is slow to respond and requires a more potent stimulus than iron therapy.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

95:497-592 (Feb. 17) 1951. **Partial Index**

*Insufflation of Air Under Skin as Therapeutic Method in Pleurisy. J. C. Gerrits.—p. 515.
Spinal Paroxysmal Hypertension. M. Koster, J. M. van der Valk, M. Frenkel and J. Groen.—p. 520.

Insufflation of Air Under Skin in Pleurisy.—According to Gerrits, there have been several reports in the literature concerning the effectiveness of the insufflation of about 50 cc. of air under the skin of chest or back in the resorption of the exudate in pleurisy. This insufflation was given once a week and proved entirely harmless and usually painless. The air is injected on the side of the pleuritic process and spreads over a rather large surface. It stimulates the skin and the subcutaneous tissue, and by reflex paths, the deeper organs, in this case, the pleura and lung, and it promotes the absorption of the exudate. It is suggested that cutovisceral reflexes are involved in this mechanism. So that the needle will not enter a blood vessel and cause an air embolism, suction is applied with the syringe plunger. The author used this treatment in 17 patients with exudative pleurisy. The treatment was ineffective in five of the patients, and in the others the absorption of the exudate was greatly or moderately stimulated and accelerated.

Nordisk Medicin, Stockholm

45:225-260 (Feb. 14) 1951. **Partial Index**

*Gastric Insufficiency: Diagnosis, Sequels and Treatment. E. Forsgren.—p. 229.
Aureomycin Therapy in Paratyphoid Due to Salmonella Enteritidis. A. Põldre.—p. 233.
Treatment with Vitamin D$_2$ in Lupus Vulgaris of Nasal Mucosa. G. M. C. Eskelund.—p. 236.
Typhoid Carrier Cured with Chloramphenicol. H. Kvadsheim.—p. 240.
Death Following Intravenous Urography. K. Fischermann and J. Ostenfeld.—p. 240.

Gastric Insufficiency: Diagnosis, Sequelae, and Treatment.—Forsgren says that the results of a single Ewald test breakfast will often be misleading, and the test breakfast should be supplemented by a test dinner containing meat, which, with its buffer action, is calculated to show the insufficiency of a small secretion of gastric juice produced by excitation with histamine; the addition of cubes of coagulated egg white will facilitate evaluation of the degree of digestion. The frequency of achlorhydria increases with age and will be a grave problem in geriatrics. Malnutrition of gastrogenic kind may lead to pernicious anemia, myelopathy, epithelial symptoms, and impairment of the phagocytic defense against infections. The author estimates that the incidence of tuberculosis is about 10 times as high in persons in whom gastrectomy has been done as in the general population. Gastric insufficiency can be compensated in high degree by carefully prepared food and a physically and mentally hygienic mode of life. Diarrhea and meteorism due to gastric insufficiency as a rule respond to treatment. Concentrated liver preparations and vitamin B are indispensable in the treatment of pernicious anemia and myelopathy. In total achlorhydria an attempt should be made by hydrochloride acid administration to restore the normal pH in the alimentary tract and normalize the bacterial flora in the gastroduodenal segment. Gastrogenic damages to the nervous system are not always wholly reversible, and therefore treatment should be begun early. A psychogenic gastric insufficiency is reversible, at least at an early stage; psychotherapy and antiachylic treatment are important. Treatment of gastric insufficiency after stomach resection often entails great difficulties. The resources for compensating postoperative gastric insufficiency are limited.

45:261-300 (Feb. 21) 1951. **Partial Index**

Ultrasonics in Biology and Medicine. S. Dalgaard.—p. 261.
*Hyperparathyroidism. J. Hellström.—p. 263.
*Subdural Tapping. J. Vesterdal and T. Walther.—p. 268.
*Paper Partition Chromatography of Histidine in Urine in Normal Pregnancy and Pregnancy Complicated with Preeclampsia. H. Zilliacus.—p. 271.
Duodenal Ulcer and Stomach Motility. M. S. Hansen.—p. 272.
Cases of Cardiac Arrest During Operation Treated Successfully. E. Millbourn, E. Nilsson and B. Eyrich.—p. 273.
Hemangioma of Kidney. K. Liavaag.—p. 276.

Hyperparathyroidism.—Hyperparathyroidism is characterized primarily by a disturbance in calcium metabolism. The most pronounced symptoms are skeletal calcification, usually in the form of so-called osteitis fibrosa generalisata, and calcium deposits in the kidneys. The prognosis after parathyroidectomy depends mainly on the degree of renal damage at the time of operation. Some improvement in renal function is possible after parathyroidectomy, but the damage usually remains or progresses. Evaluation of the prognosis requires a long observation period, as patients may apparently be well for many years but ultimately die from sequelae of the hyperparathyroidism. Renal injury is an early sign of the disease; it is ascribed to calcium deposits in the tubular epithelium and to vascular changes and is expressed by hyposthenuria and polyuria. There is usually increased blood pressure, which becomes more and more manifest and is an important cause of the unfavorable prognosis. Since early diagnosis and operative treatment are of decisive importance, the possibility of hyperparathyroidism should be borne in mind in cases of renal calculus, especially in multiple bilateral concrements, and examination of the blood calcium should be made in all patients with symptoms that might depend on hyperparathyroidism. Parathyroidectomy is the only treatment to be considered. Radiotherapy is ineffective and delays operation. Excision of the affected gland suffices in the case of adenoma. In diffuse hyperplasia, resection should be as complete as possible without risk of tetany, but partial parathyroidectomy may result in improvement. There were skeletal changes in eight of the 23 cases of hyperparathyroidism, renal calcification in nine, and both symptoms in six cases. Follow-up examination of 10 patients with solitary adenoma more than two years after the operation showed that the general condition and ability to work were often good for years, and in five patients with solitary adenoma operated on in 1950 the immediate result is excellent, but only one patient has normal renal function. The five patients with diffuse hyperplasia operated on showed improved general condition and ability to work despite continued increased blood calcium: of the four observed for over 10 years one died from uremia, two are disabled because of hypertonia, and one patient is still able to work.

Subdural Tapping.—Subdural hematoma is ascribed to trauma of the head during birth or later; this trauma may be slight and unnoted. Subdural tapping has been performed in the children's department of the Rikshospital since 1947 in the diagnosis and treatment of subdural hematoma. Vesterdal and Walther report 248 punctures, 201 for diagnostic and 47 for therapeutic purposes, in infants aged from 1 day to 19 months. Effusion of cerebrospinal fluid into the subcutaneous tissue occurred in many cases but was without significance; no other side effects were noted. Pathological fluids were found in 12 cases. In the five cases described, subdural hematoma was confirmed at operation. One patient died before further examination could be made, in two patients ventriculography failed to disclose subdural hematoma, and in four operations revealed other intracranial hemorrhage or hydrocephalus. The authors warn that since there may be a wide, free zone between the hematoma and the midline the tapping should be done as laterally as possible. Diagnosis of subdural hematoma on the basis of clinical symptoms alone is extremely difficult or impossible, and subdural tapping should therefore be used together with lumbar puncture in the examination of infants with obscure cerebral symptoms.

Paper Chromatography of Urine in Pregnancy and Preeclampsia.—Dent's modification of paper partition chromatography for qualitative analysis of free amino acids in the urine was used by Zilliacus for identification of histidine in the urine of nonpregnant women, in normal pregnancy, and in pregnancy complicated by toxemia. He finds his results support earlier observations that no histidine or only traces of histidine appear in the urine of nonpregnant women, that histidine in the urine is the rule in normal pregnancy, and that histidinuria decreases or disappears in patients with symptoms of toxemia of pregnancy. The absence of histidine in the urine in a patient with toxemic hydatid mole suggests that placental or endocrine factors are involved in the disappearance of histidine from the urine in toxemia of pregnancy.

Presse Médicale, Paris

59:325-344 (March 17) 1951

Tuberculosis as Obligatorily Reportable Disease. G. Poix and É. Bernard.—p. 325.
Action of Oxygen Inhalation in High Mountain Climbing. J. Oudot. —p. 326.
*First Cases of Cure of Primary Pneumonic Plague Obtained with Streptomycin. F. Estrade.—p. 328.

Streptomycin in Primary Pneumonic Plague.—Two patients, a man, 19, and a woman, 25, with primary pneumonic plague, were treated with streptomycin on the island of Madagascar. The total dose of the drug over a six day period was 25.75 gm. With this relatively small dose, Pasteurella pestis was still present in the sputum of the patients 20 hours after the institution of the treatment but the organisms had lost much of their virulence and were no longer capable of killing guinea pigs. Temperature was restored to normal on the sixth day, and the patients were convalescent. It appears that in vivo streptomycin rapidly effects the virulence of the pathogenic agent before a bacteriolytic action can be manifested. Systematic roentgenologic examination was made of the female patient before treatment and on the second and eleventh days after the institution of treatment. Characteristic foci of confluent bronchopneumonia were observed at the first examination; some clearing was noticeable at the second examination, and complete clearing was observed at the last examination. The therapeutic success, the economy of the therapy, and the fact that the contagious period of the patient has been limited to a short time are to be considered of greatest importance in pneumonic plague. Antiplague serum therapy, previously practiced in Madagascar, failed to cure pneumonic plague, and streptomycin was the only drug with which a cure was obtained. Systematic roentgenologic examination of persons who have been exposed to the infection may be a means of early diagnosis of pneumonic plague.

Quarterly Journal of Medicine, Oxford

20:1-92 (Jan.) 1951

The Electrocardiogram in Hypertension. A. W. D. Leishman.—p. 1.
Cholinesterase Activity of Blood and Muscle in Myasthenia Gravis. A. Wilson, G. A. Maw and H. Geoghegan.—p. 13.
Cholinesterase Inhibition and Signs and Symptoms in Myasthenia Gravis. A. Wilson, G. A. Maw and H. Geoghegan.—p. 21.
*Contribution to Pathology of Sjögren's Disease. P. Ellman, F. Parkes Weber and T. E. W. Goodier.—p. 33.
Primary Staphylococcal Pneumonia. M. O. J. Gibson and J. R. Belcher. —p. 43.
*Felty's Syndrome: Report of Four Cases Treated by Splenectomy. M. S. R. Hutt, J. S. Richardson and J. S. Staffurth.—p. 57.
Aplastic Anaemia. T. H. Boon and J. N. Walton.—p. 75.

Sjögren's Disease.—The occurrence of Sjögren's disease in a woman 34 is reported. She complained of dryness of eyes, mouth, and throat, and a dry cough aggravated by talking. Symptomatic treatment of the eyes with cod liver oil drops gave symptomatic relief. Attempts to increase the salivary secretion by pilocarpine, acetyl-beta-methylcholine chloride and physostigmine were unsuccessful. For alleviation of the dryness of the bronchial mucosa, the patient was kept for two weeks in a steam tent. This had no beneficial effect on the respiratory condition but seemed to have aggravated the patient's arthritis. A spontaneous pneumothorax developed on the right side, associated with dyspnea and cyanosis. Silver nitrate pleurodesis produced gradual adhesion of the pleural surface of the right lung. However, a gradual downhill trend developed. Death resulted from acute bronchopneumonia. Necropsy was performed, and microscopic examination of the lacrimal, parotid, and sublingual glands, of the conjunctival, buccal, nasal, and nasopharyngeal mucosa, and of the mucosa of the epiglottis, larynx, trachea, bronchi, esophagus, and their subjacent secretory glands confirmed the view that the pathological basis of the dryness of the mucous membranes and skin consists of a chronic inflammatory atrophy of unknown causation involving the salivary, lacrimal, mucosal, and sweat glands. This dryness may give rise to obstructions in the parotid and salivary glands and in the bronchial tubes, resulting in a secondary inflammatory granulomatous process and possibly suppuration.

Felty's Syndrome.—The results of splenectomy in four patients, one man and three women, with Felty's syndrome are reported on. All the patients had the characteristic triad of rheumatoid arthritis, splenomegaly, and neutropenia. There was an interval of five years between the onset of arthritis and the development of splenomegaly and leukopenia in two patients, and an interval of about 20 years in the two other patients. The arthritis was therefore advanced, and permanent deformities of some joints were present. The preoperative blood picture of all the patients showed anemia. The white blood cell count varied considerably, but in each case it was well below 3,000 per cubic millimeter at its lowest. Severe buccal ulceration often associated with neutropenia was a distressing feature in two patients. Splenectomy led to rapid cure of the ulcers in the mouth. Only one patient showed definite, measurable improvement in the joints, and the results made it clear that splenectomy should not be regarded as a treatment for the joint condition itself. There was an immediate postoperative increase in white blood cells in every patient, which was maintained for over a year. In every case the most striking feature was the improvement of general health. Felty's syndrome is probably merely a peculiar variant of rheumatoid arthritis and not a separate entity. Neutropenia, on which most emphasis was laid, is entirely secondary to hypersplenism, which may occur in any disease in which splenomegaly is a feature. The authors feel that, provided there are no associated diseases that would contraindicate surgical intervention, splenectomy should be performed in all cases. The resultant restoration of the white blood cell count to normal clears up the associated infective processes and improves the general health of the patient.

Radiologia Medica, Turin

37:1-56 (Jan.) 1951

*Carcinomas of Mouth and Pharynx Treated from 1928 to 1945: V. Results of Roentgenotherapy of Carcinomas of Hypopharynx (37 Cases). Clinicostatistical Study. B. Antoniazzi.—p. 35.

Roentgenotherapy of Carcinoma of Hypopharynx.—The author reports results of roentgen therapy in 37 cases of cancer of the hypopharynx. The group included 35 men and two women. Most of the patients were over 50. The cancer was advanced in all cases. It was located in the upper larynx in 15 cases and in the lower half in 22 cases. A biopsy was made in 20 cases. It showed spinocellular cancer in 17 cases and basocellular cancer in three cases. The treatment consisted of local roentgen therapy of the cancer lesion and the regional lymph nodes followed by ample removal of all the metastatic regional lymph nodes. The author describes the technique, dosage, and duration of the roentgen treatment. In the cases reported the hypopharyngeal cancer was vegetating in 11 cases, infiltrating and vegetating in 13, and infiltrating in 13. Metastases in the regional lymph nodes were encountered in 16 patients, six with cancer in the upper larynx and 10 with cancer of the lower larynx. The metastases were unilateral in 13 cases and bilateral in three. Neither contralateral lymph node nor visceral metastases were observed, although no necropsies were done. The four patients living five years after discontinuation of the treatment are normal, without any recurrence of cancer.

Rev. Española de Obstetricia y Ginecol., Valencia

8:1-48 (Jan.-Feb.) 1951. **Partial Index**

*Treatment of Trichomoniasis Vaginalis with Tyrothricin. J. M. Sánchez Ibáñez.—p. 15.

Treatment of Trichomoniasis Vaginalis with Tyrothricin.—Five cases of trichomoniasis vaginalis were treated by the author with a powdered mixture of 50 mg. of tyrothricin and 100 gm. of boric acid with good results. All patients were married women; one was pregnant. All had leukorrhea and acute pruritus vulvae. Gonococcus and cervical erosion were present in one patient and staphylococcus in another. Treatment consisted of a vaginal douche with 5% lactic acid and insufflation of the tyrothricin-boric acid mixture into the vagina, every other day. Bacteriologic examination of vaginal smears became negative in all cases after the first application of the drug. The treatment was given at least four times. Patients were considered cured after three monthly bacteriologic examinations of vaginal smears following the menstrual period gave negative results. The author advocates the powdered form of tyrothricin, because of its easy application and stability in the vaginal cavity and cul de sac, without inconvenience to the patient. Tyrothricin therapy significantly shortens the course of treatment as compared with other drugs.

Schweizerische medizinische Wochenschrift, Basel

81:271-294 (March 24) 1951. **Partial Index**

Alcohol and Highway Accidents. M. H. Thélin.—p. 271.
Vitamin B_{12}. M. Tausk.—p. 275.
Question of Origin of Resistance of Mycobacterium Tuberculosis to Streptomycin. P. Zadik.—p. 281.
*Treatment of Pertussis with Chloramphenicol and Aureomycin. F. Buser.—p. 282.

Chloramphenicol and Aureomycin in Pertussis.—Forty-two patients with pertussis, 23 between 1 and 4 years old, 16 between the ages of 4 and 7, and three adults, were treated with chloramphenicol (chloromycetin®). Treatment was instituted at the beginning of the paroxysmal stage. The patients did not receive antipertussis serum before they were given chloramphenicol. The antibiotic was given by mouth in doses of 50 to 60 mg. per kilogram of body weight daily for four to eight days. Chloramphenicol aerosol was administered to five patients with an inhalation apparatus three to four times daily for 10 minutes. Twenty patients with pertussis, four nursing infants, 11 children between the ages of 1 and 4, and five between the ages of 4 and 7 were treated with aureomycin. For six to eight days, 25 mg. of the drug per kilogram of body weight was administered daily. Both chloramphenicol and aureomycin favorably influenced the course of the disease and the number and severity of the paroxysmal attacks. Neither drug caused untoward reactions, and there was no distinct difference between their effectiveness. A comparison of graphic recordings of the paroxysmal attacks of cough in patients with pertussis treated with antibiotics (chloramphenicol and streptomycin) or human pertussis immune serum revealed that similar satisfactory results were obtained with both the therapeutic methods. Chloramphenicol and aureomycin had a somewhat more rapid effect than streptomycin. The immune serum is considered superior to any other therapy in infants with severe toxic pertussis associated with attacks of asphyxia, while the antibiotics seem to be more reliable in bronchopneumonia associated with pertussis. Combined treatment with antibiotics and human pertussis immune serum seems to be advisable in infants and children with severe pertussis.

Semaine des Hôpitaux de Paris

27:787-832 (March 10) 1951. **Partial Index**

Excision of Large Superficial Petrosal Nerve and Cephalic Forms of Neurovascular Disease. J. N. Taptas.—p. 787.
Attempt to Treat Delayed Mental Development in Children by Jugulocarotid Anastomosis. M. R. Klein, J. Lepintre, G. Tardieu and J. P. Held.—p. 792.
*Cerebral Scars in Children. M. R. Klein, J. Lepintre, G. Tardieu and R. Galez.—p. 796.

Cerebral Scars in Children.—In a cerebral scar there is a diffuse fibrous neuroglial hyperplasia, which tends to spread into the subcortical area and toward the ventricle, exerting an inhibitory effect on the neighboring and distant healthy tissue. The site and extent of the scar may be ascertained by clinical investigation, electroencephalographic recordings and ventriculography. Hemiplegia, epileptic seizures and delayed mental development, occurring independently or together, are the main neurological syndromes produced. Surgical excision or undercutting of the scar was performed by the authors on 50 patients in whom delayed mental development was associated with hemiplegia or epileptic attacks or both. Thirty-seven patients were followed up for several months to three years. Eighteen patients showed definite improvement, 17 were unchanged and two died, one within several hours after the operation and one within seven days. Eighteen of 33 patients with hemiplegia and three of 26 with epileptic seizures were improved, with one possible cure. Three of 23 patients with delayed mental development were improved, with an increase of about 10 in the intelligence quotient. Ten of 16 patients with a scar limited to the white matter exclusively showed improvement. None of the four patients in whom the scar had spread to large areas of the cortex were improved. Eight of 17 patients with involvement of the subcortical area showed improvement. Six of eleven patients with a scar in the rolandic area and seven of nine patients with a scar in the frontal region were improved. Five of 14 patients with a scar in the parietal region showed improvement. Treatment failed in two patients with a scar in the occipital region and in one patient with a scar in the temporal region. The operative technique varied according to the site and the extension of the scar. Total excision of the scar was performed when it was limited to a small area, while subcortical cutting without excision of an extensive scar was done in 14 instances to isolate the lesion from the healthy tissue. Definite improvement resulted from the latter intervention in 10 instances. The risk associated with surgical treatment is to be considered minimal despite the importance of the operation, and the reported results are believed to be satisfactory and encouraging.

27:865-910 (March 18) 1951. **Partial Index**

Present State of Means of Study of "Essential Epilepsy" on a Symptomatic Basis. J. Guillaume, G. Mazars and Y. Mazars.—p. 865.

*Present State of Surgical Treatment of Epilepsy. J. Guillaume, G. Mazars and Y. Mazars.—p. 871.

Neuroendocrine Syndromes and Ventricular or Cisternal Hydrops. J. Guillaume, R. Rogé and R. Djindjian.—p. 876.

Surgical Treatment of Epilepsy.—Of 78 patients with focal epilepsy who were subjected to excision of the cortex under electrocorticographic control, only 11 were found to have an epileptogenic focus with a brachial or crural motor or sensory localization, while 42 had a temporal or insular focus, and 14 a frontal focus. Clinical observations thus would have permitted a definite localization in only one-seventh of the patients. The authors have abandoned the classic procedure of electrical stimulation of the brain for establishing the topography of the cortical lesions. They prefer localization by means of electrocorticographic recording with the use of eight articulated electrodes placed in lines on the exposed cortex. The motor cortex is characterized by an electrical activity consisting nearly exclusively of beta waves, so that it can be identified without the aid of electrical excitation. The method of extending the cortical excision until any abnormal electrical activity has disappeared appears to be the most reliable one for the surgical treatment of focal epilepsy. It is indicated in patients with severe epileptic attacks that occur frequently and are not completely controlled by medication and in patients in whom disturbances of character persist despite the disappearance of the attacks. Thirty-two patients operated on according to this method were followed for two years. According to Penfield's criteria, good to excellent results were obtained in 21 of these 32 patients (64%). Medication could be discontinued within several weeks of the operation without inconvenience in seven of the 32 patients. One patient who before the operation had agoraphobia and attacks of aura vertiginosa was able to resume his former profession as a traveling salesman. A child who before the operation had been placed in an institution for incurable children did not have any attacks for two years after the operation, was able to attend school regularly, and no longer required medication. In one patient Jacksonian attacks in the lower extremity disappeared completely, and there was no secondary motor disturbance, although the epileptogenic focus was located adjacent to the paracentral lobule. Highly satisfactory results were obtained with the excision of the insular cortex in nine patients, none of whom had any attack after the operation. Recovery without sequelae was obtained also in patients with severe neurovegetative disturbances. In six patients the character disturbances disappeared simultaneously with the epileptic attacks, but these disturbances persisted in three others despite the disappearance of the attacks. In a number of patients attacks could be controlled by drugs to which the patients had not responded before the operation. In certain cases reoperation may be preferred to an extensively and perhaps unnecessarily mutilating first intervention.

South African Medical Journal, Cape Town

25:105-120 (Feb. 17) 1951. **Partial Index**

Treatment of Leptomeningitis: Report of 50 Cases Treated at Witwatersrand Mine Hospital. T. H. Stewart.—p. 105.

Whooping Cough Epidemic in Urban Native Location. H. T. Phillips. —p. 110.

*Double Duodenal Ulcer with Perforation Following Burn. M. R. Mynhardt.—p. 1[illegible].

Double Duodenal Ulcer Following Burns.—Mynhardt reports the case of a woman, 34, who sustained second and third degree burns, involving 60 to 64% of the body surface, when her clothing caught fire. Petrolatum gauze and pressure dressings were applied. Penicillin and streptomycin were given. Shock was combated by blood and serum transfusions and by other intravenously administered fluids. The diet was high in proteins and vitamins. When contracture deformities of hips and feet began to develop, a plaster bed was constructed. Except for occasional small rises in temperature the patient progressed favorably for several weeks. Then she began to deteriorate rapidly; abdominal tenderness and signs of peritonitis developed. There was temporary improvement following treatment with aureomycin, penicillin, vitamin K, heparin, and a digitalis preparation, but then signs of hypostatic pneumonia appeared, and death followed. At necropsy a Curling's ulcer approximately ¾ in. (1.91 cm.) long and irregular in shape was found 1 in. (2.54 cm.) distal to the pyloric sphincter on the anterosuperior wall of the first part of the duodenum. The ulcer had perforated but was sealed off by omental adhesions. A blackish discoloration (due to local thrombosis) around the edge of the ulcer was a prominent feature. A more circular, unperforated ulcer was present in the second part of the duodenum. The history, etiology, and histopathology of Curling's ulcer are discussed. The most widely accepted theory of the etiology of this ulcer is that it results from local thrombosis, which in turn is caused by the toxemia and sepsis associated with burns.

Union Médicale du Canada, Montreal

80:153-284 (Feb.) 1951

Various Therapeutic Aspects of New Antibiotics and of Penicillin. L. N. Larochelle.—p. 157.

*New Methods for Diagnosis and Treatment of Syphilis. J. Archambault. —p. 173.

Evolution of Therapy of Urethritis. L. Sylvestre.—p. 183.

Treatment of Nontuberculous Diseases with Streptomycin. J. Prévost. —p. 187.

Thyroidectomy. C. E. Grignon, R. Grignon and J. Grignon.—p. 193.

Diagnosis and Treatment of Syphilis.—The use of penicillin has profoundly changed the treatment and the prognosis of syphilis. In the majority of the cases, early infection yields to a total dose of 5,000,000 to 6,000,000 units of penicillin administered in the course of 10 days. Institution of this treatment during pregnancy almost certainly prevents the congenital infection, and it greatly simplifies the treatment of late syphilis. Neurosyphilis, if diagnosed in the preclinical period or before irremediable destruction of tissues has occurred, may in general be arrested by repeated courses of penicillin, and malaria therapy may be required in only a few particularly resistant cases. A positive qualitative reaction of the blood, the cerebrospinal fluid or both to the various tests should not be considered sufficient for establishing the diagnosis or prognosis of syphilis. Quantitative serologic tests and a thorough evaluation of the clinical manifestations are indispensable. In cases of late syphilis, the disease process can be definitely checked and the spirochetes completely destroyed while the blood or even the cerebrospinal fluid still gives positive reactions to the Wassermann or Kahn tests. Consequently, an isolated positive reaction to a serologic test is not necessarily an indication of active infection that requires treatment. The serologic curve, the duration of the infection and the total amount of treatment received represent the essential considerations for the institution, conduct and discontinuation of treatment of syphilis.

BOOK REVIEWS

Yellow Fever. Edited by George K. Strode, M.D., Director, International Health Division, Rockefeller Foundation, New York. Cloth. $9.50. Pp. 710, with 77 illustrations. McGraw-Hill Book Company, Inc., 330 W. 42nd St., New York 18; Aldwych House, Aldwych, London, W.C.2, 1951.

This distinguished volume is not a history of yellow fever of olden days, with its frequent epidemic visitation during the 18th and 19th centuries to the east coast and gulf ports of the United States and to the cities of Southern Europe. Nor is it a narrative of the discoveries, made by Finlay, by Reed and his colleagues and by Gorgas, of the etiology, epidemiology, and control of urban yellow fever. While these dramatic events are briefly considered in their appropriate setting, this book is primarily an account of the investigations of the Rockefeller Foundation. During the period 1916-1949, 422 articles on yellow fever were published by staff members of the Foundation, which made a financial contribution of nearly 14 million dollars to carry out these projects.

Following a preface by Dr. Strode, there are 10 separate sections, each consisting of several closely related chapters, viz., (1) Landmarks in the Conquest of Yellow Fever, (2) The Virus, (3) Pathology, (4) Immunology, (5) Arthropod Vectors, (6) Mammalian Host, (7) Clinical Aspects and Diagnosis, (8) Epidemiology, (9) Control, and (10) Costs and Man Power. All of this information has been woven together into an unusually lucid narrative. Even the most technical material is clearly presented. Written by experts, the data are authoritative and are probably as objectively presented as is humanly possible. Although no attempt has been made to provide an exhaustive treatise, the facts presented are quantitatively impressive, while the findings constitute valuable scientific knowledge and at the same time important landmarks in the prevention of the disease.

Briefly considered, the most significant developments in the campaign against yellow fever from 1916 to the present time have been twofold. In the first place, while effective control of Aedes aegypti, the vector of epidemic urban yellow fever, eliminated the danger of outbreaks in nontropical areas as in the United States, it did not provide the same degree of safety for cities in South America or tropical Africa. Marginally rural epidemics developed which at times spread to the cities. Fundamentally, yellow fever was found to be a disease not of human populations but of dense tropical forests, where it is enzoötic and epizoötic among monkeys and at times other mammals, and is transmitted by sylvatic mosquitoes. Human entry into these enzoötic areas or the egress of infected semidomestic mosquitoes or marauding monkeys from the jungle into near-by rural habitations provides the opportunity for human exposure. Thus, effective control of Aedes aegypti in the tropics does not eliminate yellow fever.

The second fundamentally important discovery consisted in the development of a safe vaccine to protect persons likely to be exposed to the disease. Between 1940 and 1947, more than 28 million doses of vaccine were prepared and distributed by the Yellow Fever Laboratory of the Rockefeller Foundation in New York City, while other laboratories furnished additional amounts. Moreover, growing out of the immunologic studies the mouse protection test made it possible to determine whether immune bodies had developed in vaccinated subjects; likewise, by surveying populations in extensive areas adjacent to known enzoötic zones, epidemiologists were able to determine how far the disease had extended from the sylvatic foci. Similarly, the test has been useful in discovering which mammals in the sylvatic foci had had, or are susceptible to the infection.

Undoubtedly these discoveries would have been made eventually had not the Rockefeller Foundation entered into the problem. Dr. Strode and his colleagues give generous credit to the many independent and associated investigators who have concurrently contributed to the elucidation of the questions which required solution. Nevertheless, the professional and financial support of the Foundation provided expert coördination and guidance, as well as momentum.

The volume is faultlessly written and beautifully printed. Included are an excellent bibliography and a very satisfactory combined subject-author index. The heavy linen cover is well adapted for hard use. One error which has been noted is the use of the term "endemic" instead of "enzoötic" in reference to the sylvatic infection.

Rest and Pain. By John Hilton, F.R.S., F.R.C.S. Edited by E. W. Walls, M.D., Ch.B., B.Sc., Professor of Anatomy in University of London at Middlesex Hospital Medical School, and Elliot E. Philipp, M.A., M.B., B.Chir., Honorary Demonstrator in Anatomy at Middlesex Hospital Medical School, London, in collaboration with H. J. B. Atkins, D.M., M.Ch., F.R.C.S., Director of Department of Surgery, Guy's Hospital, London. [Originally issued in 1863 with title: On the Influence of Mechanical and Physiological Rest in the Treatment of Accidents and Surgical Diseases, and the Diagnostic Value of Pain.] Sixth edition. Cloth. $8. Pp. 503, with 105 illustrations. J. B. Lippincott Company, 227-231 S. 6th St., Philadelphia 5; Aldine House, 10-13 Bedford St., London, W.C.2; 2083 Guy St., Montreal, 1950.

This is a presentation of a lecture series delivered at the Royal College of Surgeons in the middle of the nineteenth century. A surgical classic, this book has been revised and reprinted many times. There are numerous notes by the editors, which add a modern interpretation to the observations of Hilton.

This book is written in a charming and informal manner. It is replete with case histories presenting symptoms and their interpretation, anatomy, pathology, and treatment for a wide variety of diseases. In many instances, one is amazed at the difference between nineteenth and twentieth century concepts of medicine. The principal theme that recurs throughout the volume is that simple rest would benefit or cure a great many diseases. An important task of the physician is to recognize disease and to place the involved portion of the body at rest. Another point that is stressed is that rest is not harmful to normal portions of the body.

Modern physicians often fail to realize the change that has taken place in medicine within the preceding half-century. Reading this volume must increase one's admiration for the physicians of the past, who were able, without present laboratory and pharmacologic aids, to accomplish so much in the care of the sick.

Soil and Freshwater Nematodes: A Monograph. By T. Goodey, O.B.E., D.Sc., F.R.S., Head of Nematology Department, Rothamsted Experimental Station, Harpenden, Herts. Cloth. $7. Pp. 390, with 191 illustrations. John Wiley & Sons, Inc., 440 4th Ave., New York 16; Methuen & Co., Ltd., 36 Essex St., Strand, London, W.C.2, 1951.

Most physicians whose practice includes the diagnosis and treatment of common nematode diseases are probably unaware that the roundworm parasites of man and domestic animals comprise only a small segment of the total species of nematodes in the world. By far the largest number are free-living, in soil and freshwater. Some are distant kin to the trichina worm (Trichinella spiralis) and the whipworm (Trichocephalus trichiurus); others are more nearly related to Strongyloides and the hookworms. Certain free-living nematodes, for example, species of Rhabditis, Rhabditiella, Turbatrix (the "vinegar eel"), Ditylenchus (the "onion bulb nematode"), and Heterodera (the "root-knot nematodes") have been found as contaminations of human feces, urine, or even skin lesions, and thus require diagnostic differentiation to eliminate them as potential agents of human disease.

The author of this monograph is one of the few world authorities in his field. He has provided the first up-to-date comprehensive manual on the subject, which is necessarily technical. After a short résumé of approved technics for collecting free-living nematodes and preparing them for

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The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

characteristics of these worms are described; then all the known genera are systematically presented, with a description of the type species (or other better known species) of each genus, and the names of the other species of the genus are listed. For the more common species there is brief bionomic information, including the geographic locations where the organisms have been found.

As a minor criticism it may be pointed out that some of the genera included in this monograph are primarily parasites of plants and as such are important in agriculture and horticulture, while their free-living stages in the soil are relatively incidental. Strongyloides and hookworms likewise have such a free-living stage in the soil. Furthermore, the monograph would have been more comprehensive if the larval stages of these worms had received brief consideration.

Excellent figures add much to the usefulness of the text. The type is clean, and the format is unusually pleasing. The book is substantially bound. It constitutes a valuable companion volume to Goodey's "Plant Parasitic Nematodes and the Diseases They Cause" (1933) and will be welcomed as an important contribution to invertebrate zoology.

A History of Nursing. By Gladys Sellew, Ph.D., R.N., Chairman of Department of Sociology and Social Work, Rosary College, River Forest, Ill., and C. J. Nuesse, Ph.D., Assistant Professor of Sociology, Catholic University of America, Washington, D. C. Second edition. Cloth. $3.75. Pp. 439, with illustrations. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1951.

This edition, like the first, has as its central thesis the inextricable interweaving of nursing service with all other branches of human culture. This revision remains unaltered in general philosophy. The authors retain the conviction that nurses can gain insight into their own roles through study of professional history in the light of social history.

Aspects which are considered include the relationship between social and cultural systems and health and disease, the emergence of an art of nursing among primitive people, and the advances and regressions of nursing as a result of the spiritual revolution of Christianity, the fall of Rome, the Protestant revolt and the humanitarian movement. The founding of the nursing profession by Florence Nightingale, its worldwide extension, with particular emphasis on its background, beginning, and expansion in the United States, are discussed. Considerable attention is given to the development and present status of nursing education.

This book points out not only service rendered by the nursing profession but also the socioeconomic changes through the ages that have given stimulation and direction to its development. This approach is in accord with the persistent efforts of nursing educators toward the concept that the patient and his environment are inseparably related factors in nursing care.

Retire and Be Happy. By Irving Salomon. Cloth. $2.95. Pp. 205. Greenburg, Publisher, Inc., 201 E. 57th St., New York 22, 1951.

This book contains considerable material of interest to persons about to retire, but its scope and interest are limited to those able to retire with considerable financial provisions. Although the author denies that one must be provided with an adequate income, all his criteria for successful retirement are based on the assumption that this is indeed the fact. Many will differ with the author's conclusion that a man should retire and cease making money as soon as he is able, even if this happens in his thirties or forties rather than in the more usual sixties and seventies. While decrying the needless making of money, the author nevertheless cites with apparent approval a number of instances in which hobbies have turned into lucrative occupations for the retired. The book contains too many glib assumptions, such as that a planned retirement assures a happy retirement and vice versa. In his chapter on philosophy and religion, he has stepped so gingerly to avoid offending any specific philosophic or religious groups that he ends up with a conglomeration of vague nothingness. He devotes a chapter to health, but acknowledges that it contains little or nothing because "this is a topic to be left to the medical profession."

The book is ostensibly based on a casual study of 405 retired persons, apparently all men. The material itself is rather slender to form the basis of a book, and this makes the entire manuscript repetitious and wordy. The editing is careless, exhibiting a number of instances of plural subjects with singular verbs and similar evidences of loose writing. This book is a useful effort which does not quite achieve excellence.

Annual Review of Physiology. Volume XIII. Victor E. Hall, editor, Jefferson M. Crismon and Arthur C. Giese, associate editors. Cloth. $6. Pp. 457. Annual Reviews, Inc., Stanford, California, 1951.

This volume, like the preceding ones, presents a series of papers on the current status of various topics in physiology. Each paper is written by an authority in the field. The majority of the contributors are from American laboratories; four of the papers are by European scientists. D. K. Hill of the University of London, in collaboration with A. V. Hill, has written on muscle, dealing particularly with muscle proteins and the biophysics of muscular contraction. Gestaut of Marseille has contributed a section on the electrical activity of the brain. Moruzzi of the University of Pisa has reviewed the somatic functions of the nervous system, while Runnstrom and Gustafsun of the University of Stockholm discuss developmental physiology, with particular emphasis on the biochemical approach to morphogenesis. In the discussion on permeability, the importance of distinguishing between simple diffusion, complex formation, and active selective transport is stressed. The effects of ionizing radiations on living systems are capably discussed, and the current status of certain aspects of thermophysiology is presented. Separate papers deal with the digestive system and with the liver, the latter paper placing particular emphasis on the histophysiology of the liver cell. Discussions are also devoted to other fundamental subjects, such as peripheral circulation, respiration, heart, kidney, conduction and transmission of nerve impulses, and blood volume. As might be expected, the discussion of the endocrine glands centers largely on the anterior hypophysis and the adrenal cortex, while the hypophysis and the sex hormones receive additional attention in the discussion of the physiology of reproduction. A pleasing aspect of the book is the prefatory chapter, by C. J. Wiggers, in which the author, on the basis of personal experience, interprets the influences that have aided the development of physiology during the past 50 years. This book should be of value to the reader interested in a well-documented and authoritative presentation of current trends in physiology.

Diseases of the Heart and Circulation. By Paul Wood, O.B.E., M.D., F.R.C.P., Director, Institute of Cardiology, London. Cloth. $12.50. Pp. 589, with illustrations. J. B. Lippincott Company, 227-231 S. 6th St., Philadelphia 5; Aldine House, 10-13 Bedford St., London, W.C.2; 2083 Guy St., Montreal, 1950.

This book, originally prepared in 1950 for distribution in England, has been reprinted for distribution in the United States. In it, the author attempts to cover the subject matter systematically, based on knowledge gained especially at the British Postgraduate Medical School, at the National Heart Hospital (London), and at the Rheumatic Fever Center at Taplow. He is in a sense, therefore, presenting his interpretations of the points of view of these important centers of British cardiology as well as those gleaned from the literature and his own experiences. This should be of considerable merit to the American reader, who, by comparing this British point of view with the traditional American one, may find some of the differences of value.

The subject matter is comprehensively covered. The style is clear and simple, the format pleasing and the illustrations ample, although at times one has the feeling that the author is presenting too many electrocardiograms (at times, seemingly all he has on a subject) for a book of this sort. The author brings in a great deal of the newer knowledge. For example, data procured with catheterization are well documented, so that the chapter on congenital heart disease is particularly well covered. The chapter on traumatic lesions is excellent and brings out certain facts that are sometimes neglected in many American textbooks. Obviously the presentation will not accord in all instances with American teachings, although the author is cognizant of the recent developments on this side of the Atlantic. This book is highly recommended as a worth while addition to the libraries of internists and cardiologists.

QUERIES AND MINOR NOTES

IMMUNIZATION DURING POLIOMYELITIS SEASON

To the Editor:—*I would like references on diphtheria immunization and other immunizations as related to poliomyelitis. Should immunizations be carried out during the "polio" months?* *D. C. Badger, M.D., Hobbs, N. Mex.*

Answer.—The Journal of Sept. 16, 1950, contains an editorial (page 240) and a letter from Dr. James P. Leake (page 259) in which earlier references on this subject are cited. Since then Anderson and Skaar (*Bull. Univ. Minnesota Hosp. and Minnesota M. Foundation* 22:359-370 [March 9] 1951) have published a study of data from the Minnesota outbreak of 1946. Their observations are similar to those reported in the British and Australian studies. Another recent reference is "Discussion on Poliomyelitis Following Inoculations," Section of Epidemiology and State Medicine (*Proc. Roy. Soc. Med.* 43:775-782 [Nov.] 1950). The editorial cited states, "In view of available evidence it might be advisable to postpone diphtheria and/or pertussis immunization during a poliomyelitis epidemic." During the "polio season," however, immunization has not been proved to entail any added risk to subjects in communities that are at the time free from poliomyelitis.

EYE INFECTION FROM A CORNSTALK

To the Editor:—*A patient abraded his right eye with a cornstalk about six weeks ago. I was unable to obtain a culture from the cornea, but I have obtained a fungus from the anterior chamber by paracentesis. This fungus has been identified as Paecilomyces after growth on proper mediums. He has had various types of antibiotics and chemotherapeutic agents locally and parenterally. While the wound was cauterized when first seen, the infiltration has spread over and through the cornea. The patient is at present receiving potassium iodide by mouth and sodium iodide intravenously. The pathologist says that Paecilomyces is a contaminant and not pathogenic, but the condition of the patient's eye is severe.*

M.D., Alabama.

Answer.—Paecilomyces is such a common contaminant on the special culture medium for fungi that the etiological significance of your finding seems questionable, especially since (1) cultures from the cornea have been negative and (2) the clinical course of the keratitis as described is not characteristic of fungus infection. It would seem more likely that the keratitis is due to a pathogenic bacterium or virus not easily demonstrated by culture. If it is not too late for any further attempt at constructive therapy, more intensive topical administration (by means of cotton pledgets placed on the cornea, eye baths or iontophoresis) of, alternately, an antibiotic and a sulfonamide could be tried.

TYPHOID VACCINATION

To the Editor:—*I would like information on dosage of the intracutaneous typhoid vaccination and its efficacy in comparison with the standard subcutaneous technic.*

H. B. Eisenstadt, M.D., Port Arthur, Texas.

Answer.—Intracutaneous inoculations for typhoid immunization have been reported favorably. For the "rapid method," injections are made every other day. The doses are 0.1 cc., 0.2 cc., 0.3 cc., and 0.4 cc. (a total of 1.0 cc.). It was reported by Naumer and Nerb (*Arch. Pediat.* 60:63 [Feb.] 1943) that within one week after the initial intracutaneous injection of typhoid vaccine, agglutinins appeared and that they reached their peak at three weeks. Subcutaneous inoculations give similar results.

CIGARET SMOKING

To the Editor:—*An asthmatic patient, who has not had an attack for over a year, desires permission to continue smoking. Does a cigaret holder make the cigaret less harmful? Can you suggest the cigaret that is the least harmful?*

M. B. Daitch, M.D., Santa Monica, Calif.

Answer.—Asthmatic attacks may be precipitated, or aggravated, by smoking, as a result of the physical irritation of the hot, particle-laden smoke; the chemical stimulation of the nose, the upper respiratory passages or the bronchi, by the ammonia in the sidestream smoke or the aldehydes, the tars or the nicotine in the mainstream smoke, with reflex bronchial contraction. More specific bronchoconstriction may attend allergic reaction to tobacco, probably to antigenic proteins in the tobacco, or the pharmacodynamic effect of the nicotine and other alkaloids in the smoke. The use of a cigaret holder, especially with fresh filters in the stem, and avoidance of burning too short a stump of cigarets, may diminish the physical and some of the chemical sources of irritation. Only relatively slight reduction in the nicotine content of the smoke is obtained by these means. Most of the so-called denicotinized cigarets contain little less nicotine than available oriental or Caribbean brands, but the recently introduced naturally low nicotine tobaccos substantially diminish this factor. So-called asthma cigarets, containing cubeb, stramonium, lobelia, potassium nitrate or other drugs, were formerly frequently used in treatment of attacks, and even tobacco has been recommended during attacks, but these are rarely recommended now.

COLD STERILIZATION OF INSTRUMENTS

To the Editor:—*What are the most reliable solutions for cold sterilization of instruments and hypodermic needles? How does 70 per cent ethyl alcohol compare with benzalkonium chloride 1:200 and with cresol solution?*

E. R. Kaback, M.D., Otisville, N. Y.

Answer.—Chemical agents cannot be relied on to sterilize instruments, syringes and needles, primarily because such agents do not destroy bacterial spores. Neither is virus of homologous serum jaundice always destroyed by chemical agents. Sterilization by heat is the only positive method; subsequent to heat sterilization, instruments may be stored in sterile solutions of certain chemical agents that contain rust-proof substances.

Price (*Arch. Surg.* 60:492 [March] 1950) stated: "For many reasons alcohol is an unsatisfactory agent with which to attempt cold sterilization of 'sharps' and other instruments. Spores are not killed. Even vegetative bacteria may escape destruction if they are hidden in the joint of scissors, or are protected by residual grease or blood clot or if they lie in some inaccessible part of a complex instrument, to which the alcohol does not penetrate. Alcohol, or any other cold solution for that matter, should not be expected to sterilize the lumen of a needle dropped into it. A momentary dip of an instrument into alcohol is a futile gesture; yet prolonged soaking tends to rust metal. No ideal germicidal solution for cold sterilization of instruments has yet been discovered. Some of the better preparations in current use contain alcohol as an ingredient."

TYPHUS IMMUNIZATION

To the Editor:—*I am planning to travel an irregular route through the Carribbean Islands, stopping in out-of-the-way hamlets. Should I have typhus immunization before I go?*

Darius Gray Ornston, M.D., Philadelphia.

Answer.—Although the danger does not seem to be great, it would be a good precaution to have typhus immunization before starting on your journey.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

BLACKSTRAP MOLASSES

To the Editor:—*I would appreciate information about the merits of blackstrap molasses.*

C. Ward Crampton, M.D., New York.

Answer.—The following information seems to be reliably established in regard to the nutritive value of blackstrap molasses.

The approximate composition is sucrose 36%, invert sugar 21%, ash 7 to 15%, and moisture 13%. (average of 100 samples from major sugar production areas, published in 1947). Ash has a potash content of about 50%, expressed as K_2O; lime 6.5%, expressed as CaO, and magnesium oxide 4.3%, expressed as MgO. The anions are chiefly sulfates and chlorides, with some carbonate, silica, and phosphate. The approximate vitamin content is, in milligrams per ounce of dry weight:

inositol	50.0
thiamine	0.024
riboflavin	0.069
pyridoxine	0.054
nicotinic acid	0.629
pantothenic acid	1.80
biotin	0.048
folic acid	0.00122

Note that in no instance, with the exception of inositol, does the vitamin content reach a value that makes an appreciable contribution to the human diet, when compared with other recognized protective foods. Despite the fact that molasses does contain a variety of minerals and vitamins, there is no justification for giving it major recognition as a protective or health food. It is widely known over the entire world as a stock food, and it is likely to remain in that category among informed persons.

ATHLETICS AND RHEUMATIC FEVER

To the Editor:—*At the age of 5 years, a boy had an acute attack of tonsillitis with fever and a secondary streptococcic infection of the blood stream. At this time, a mitral, presystolic murmur developed. This was before the days of antibiotic drugs. After months of complete bed rest, there was a seemingly complete recovery. After this episode a tonsillectomy was done. Joint symptoms were never pronounced. Now 10 years later, the patient presents no evidence of disease. May one call the disease described rheumatic fever? What advice should be given the parents regarding his participation in athletics?* *M. G. Seelig, M.D., Atherton, Calif.*

Answer.—From the history of acute tonsillitis occurring at the age of 5 years, with findings of mitral and presystolic murmur, one must conclude that the patient suffered from an attack of rheumatic fever with rheumatic heart disease. If at present the patient shows no evidence of disease, it would not seem necessary to advise his parents that his participation in athletics, such as baseball, football, basketball and tennis, need be restricted.

SPECIFIC GRAVITY OF URINE

To the Editor:—*What effect have glycosuria and albuminuria on the specific gravity of the urine? Will sugar or albumin of 1+, 2+, 3+, or 4+ raise the specific gravity appreciably?*

F. A. Stewart, M.D., Colorado Springs, Colo.

Answer.—Glycosuria and albuminuria increase the specific gravity of the urine. Roughly, each 1% of dextrose in urine will increase specific gravity by 0.004 and each 1% of protein by 0.003. If 4+ protein be taken as 500 mg. per 100 cc., the specific gravity increase due to albumin would be less than 0.002. If 4+ sugar be taken as 2%, the increase would be 0.008. Actually, terms like 1+ have no quantitative value and in different laboratories might be applied to urines differing twofold to fourfold in content of sugar or albumin. In the same laboratory, 4+ may be used for one specimen with 1.8% and for another with 12% sugar content, or for one specimen with 350 mg. and another with 5,000 mg. of albumin per 100 cc. The difference in specific gravity of the two former specimens would be 0.040; of the latter two, 0.014.

POOR OBSTETRICS

To the Editor:—*A multigravida ruptured membranes spontaneously three weeks prior to term; one week later she was admitted to the hospital for what was thought to be false labor. The attendant diagnosed a breech presentation and dismissed her from the hospital after contractions ceased. Four days later, a second attendant was called; a hand prolapsed from the vagina, and the transverse presentation was recognized. The patient was hospitalized, and a rectal examination was done. The attendant felt there was dilatation of about 4 cm. and gave 0.10 cc. of posterior pituitary and repeated this dose in 30 minutes. Only a few slight contractions resulted. A third attendant saw the patient and performed a podalic version under deep ether anesthesia. There was a contraction ring at the internal os, and an arm was delivered with difficulty, with fracture of the humerus. Difficulty was experienced in delivering the after-coming head with Piper forceps through a partially relaxed contraction ring. However, both mother and child were in good condition soon after delivery. Was the use of posterior pituitary judicious?*

M.D., Georgia.

Answer.—Not only the mother and baby but also some of the attendants were fortunate in this case. This represents poor obstetrics. It is extremely hazardous and a sign of complete ignorance to give a patient posterior pituitary in the presence of a transverse presentation, regardless of the amount of cervical dilatation. Luckily the posterior pituitary produced only "a few slight contractions." Furthermore, the contraction ring at the internal os was most likely not a contraction ring but simply an indication that the cervix was not completely dilated. This incomplete dilatation most likely accounted for the difficulty in performance of the version and also in delivery of the after-coming head with Piper forceps. One should never apply forceps before the cervix is completely dilated.

SYPHILITIC BLOOD AND TRANSFUSIONS

To the Editor:—*What is the consensus on the institutional use of syphilitic blood for transfusions (infectiousness, treatment of the blood and medicolegal aspects)?*

A. Gonzalez-Lujan, M.D., San Jose, Costa Rica, C. A.

This inquiry was referred to two authorities, whose respective replies follow.—Ed.

Answer.—It is generally accepted that Treponema pallidum in citrated blood dies after 48 to 96 hours of storage in the refrigerator. Some of the state departments of health in the United States prescribe that blood be kept at refrigerated temperature for two to four days before being used. According to current knowledge, therefore, citrated blood maintained for two to four days at refrigerated temperature is no longer capable of transmitting syphilis.

Answer.—The Bureau of Legal Medicine and Legislation has had a number of inquiries concerning this matter which indicated that there have been legal proceedings instituted against physicians who have given patients blood of a syphilitic donor, but apparently none of these cases have reached the appellate courts. They have either been settled or have terminated in trial courts. One case arose in Connecticut which reached the Supreme Court of Errors, but it was remanded to the trial courts for a new trial because of an error committed by the lower court with respect to the statute of limitations.

In the absence of an acute emergency, a physician who uses the untested blood of a donor for transfusion, and thereby transmits syphilis to the recipient, should be prepared, in case of suit, to justify his course of action by convincing evidence that in pursuing the course he did, he exercised that reasonable degree of skill, knowledge and diligence ordinarily possessed and exercised by physicians under the same or similar circumstances. In an acute emergency, a physician may be faced with the choice of using the blood of an untested donor, thereby assuming the risk of transmitting syphilis to his patient, or refusing to use the untested blood, thereby assuming the risk that his patient might die because of his refusal to use the blood. When he is faced with such a choice, the alternatives should be fully explained to the patient or to someone authorized to act for him or her, leaving the patient or other responsible person to exercise his or her own judgment in accepting or rejecting the blood of the untested donor. In such a case, the acceptance or rejection should by all means be in writing. When a patient cannot make a rational decision and when no other authorized person is available to act in his or her stead, and an emergency exists, it is difficult to conceive of a court's condemning a physician for adopting necessary procedures to save his patient's life. After all, syphilis is curable. A life extinct is beyond recall.

PENILE LESIONS THAT SIMULATE RINGWORM

To the Editor:—*A patient had a lesion on the glans penis, and the pathologist reported that fungi were present. At first the lesion was sharply circumscribed and flat, with loss of the normal texture of the glans; later there developed a scaling appearance, which looked more like fungus. He has no evidence of fungus infection elsewhere on the body. Please give advice regarding treatment. I have tried (1) ointment sopronol® propionate-caprylates compounds; (2) desenex® ointment, and (3) indelible pencil applied locally. At present half-strength Whitfield's ointment is being used. None of these has helped.* H. E. Rudersdorf, M.D., Sioux City, Iowa.

Answer.—Penile lesions that simulate ringworm are sometimes manifestations of diseases such as fixed drug eruption, psoriasis, lichen planus, or erythroplasia. If hyphae or spores were recovered from the lesion, it should respond to the type of treatment already used. It would be well to culture the organism and, if it is found that fungus is no longer present, to perform a biopsy. If fungus is present, the lesion might respond to treatment with carbol fuchsin or dilute, ⅛ strength, benzoic and salicylic acid (Whitfield's) ointment.

STIMULATION OF GRANULATION AND EPITHELIALIZATION

To the Editor:—*I have used Peruvian balsam for many years to stimulate granulation, and it has seemed to be effective. Is there some modern substance that has the same action? I have also used scarlet red to induce epithelialization, but it is not adherent to a moist surface. Is there a better substance that will stay more intimately applied?*

William H. Oatway Jr., M.D., La Vina, Calif.

Answer.—Among other substances used are chlorophyl compounds, red blood cell paste and acetic acid, 0.25 to 0.5 per cent mixed with 5 per cent glycerin and isotonic sodium chloride solution. Each of these has its advocates, as has Peruvian balsam. Healing of lesions may be delayed because of infection or other factors, such as poor circulation in the involved area. It is extremely doubtful that granulation and epithelialization can be stimulated in the sense that tissue repair is accelerated beyond the normal rate. Conceivably, certain of these agents may bring about a local condition more conducive to a normal healing process.

CORTISONE, HAY FEVER AND PREGNANCY

To the Editor:—*What is the status of orally administered cortisone in treatment of ragweed or other hay fever? Is there any danger in its use during any of the trimesters of pregnancy?*

M.D., Canada.

Answer.—The available evidence for the effectiveness of cortisone in hay fever is as follows: The results vary with different workers, but there is a rather general trend in the feeling that the benefit in hay fever is not as pronounced or as frequent as in asthma. On the question of the effect of cortisone given orally there is increasing evidence that the oral route is as useful as the subcutaneous. The doses of cortisone to be used in a condition such as hay fever would depress pituitary function. Since pituitary activity is an essential phase of the physiology of pregnancy it can be concluded that cortisone would be contraindicated in this state.

RECURRING GALLSTONES

To the Editor:—*A 42 year old man underwent a cholecystectomy for gallstones in May 1940. Common duct stones were removed in a second operation in 1948, at which time common duct T-tube drainage was employed for nine months, with normal cholangiograms. In January 1951, the common duct was found filled with soft stones and biliary mud and required long-armed T-tube drainage. Results of liver function tests have not been diagnostic of any malfunction of the liver. Please advise on what procedure should be done beyond prolonged drainage to obviate further recurrent deposits in the ducts.*

John C. Cottrell, M.D., Long Beach, Calif.

Answer.—No alteration in liver function has been demonstrated to accompany or precede the formation of stones in the gallbladder or biliary ducts. Furthermore, no alteration in the chemical composition of hepatic duct bile has been found to accompany or precede the formation or re-formation of stones in the biliary ducts. Theoretically an excessive amount of cholesterol in the bile or a diminished amount of bile salts and higher fatty acids, which keep the cholesterol in solution, should favor the formation of cholesterol stones; some evidence implicating both of these factors has been obtained. It seems likely that the great tendency for stone formation in the gallbladder as compared with the exceedingly rare formation of stones in the common duct is due to the concentrating function of the gallbladder mucosa and the resulting concentration of the gallbladder bile. It seems likely that in most cases gallstones form in the gallbladder and subsequently escape into the cystic, common and hepatic bile ducts. While there is considerable question that calculi form spontaneously in the bile ducts, there is no doubt that calculi, originating in the gallbladder and passing into the bile ducts, can increase markedly in size in the new location. In many cases, stasis of bile in the common bile duct brought about by the presence of stones is a factor in this growth of common duct calculi. Foreign bodies, such as rubber tubes, vitallium® tubes or glass cannulas, in the common bile duct or hepatic duct regularly cause the deposition of compounds of calcium and bile pigment. In the case described, it is probable that the common bile duct has become markedly enlarged as a result of the formation and re-formation of common duct stones and resultant biliary stasis. In cases of this type, excellent results have been obtained by anastomosis between the common bile duct and the duodenum after the stones in the duct have been removed. If such an anastomosis is made, it should be of good size, 1 to 2 cm. in length, so that duodenal content, passing into the common bile duct during digestion, may readily escape later into the duodenum. Whereas a large anastomosis usually provides complete relief, a small anastomosis may do more harm than good.

ALCOHOL AND GOUT

To the Editor:—*Why are alcoholic beverages not permitted for a patient having gout? All of my textbooks recommend omission of alcoholic beverages, but no reasons are given.*

T. E. Kilkenny, M.D., Winneconne, Wis.

Answer.—There have been divergent opinions as to the importance of alcoholic beverages in the treatment of gout, but clinicians of wide experience have repeatedly observed provocation of acute attacks of gout after alcoholic sprees.

Disturbances of uric acid elimination have been observed in healthy subjects following administration of alcoholic liquors; also, mobilization of stored purine has been noted in gouty patients following the use of alcohol (Grafe, E.: Metabolic Diseases and Their Treatment, Philadelphia, Lea & Febiger, 1933, p. 481). This evidence suggests, but does not prove, that the metabolism of gouty patients might be disturbed by alcohol.

As regards most alcoholic liquors, purine content is negligible. However, dark beers have a purine content of 0.01 to 0.02 per cent, and, if such beers are consumed in large quantities, the amount of purine added to the intake would be important.

BORIC ACID A POOR DEODORANT

To the Editor:—*I would like information regarding the use of boric acid powder as a body deodorant with respect to its efficacy and its hazards.*

Watson W. Eldridge, M.D., Washington, D. C.

Answer.—No carefully controlled studies of the effect of boric acid as a deodorant have been found. Boric acid will not penetrate the unbroken skin. Long immersion of the extremities in saturated (5 per cent) solutions fail to show any increase of boron in body fluids or excretions. However, it is rapidly absorbed through abraded skin or granulating wounds and under these circumstances is capable of producing marked toxic symptoms.

Boric acid is a very feeble bactericidal or bacteriostatic agent. Since its effectiveness as a deodorant would depend on its ability to decrease the number and type of the skin surface flora, it is probably a poor choice for deodorant purposes.

DAILY WETTING OF HAIR

To the Editor:—*Is there any harm in thoroughly wetting the hair daily, for cosmetic reasons? I have done it for years and have all my hair. Many who disclaim the practice are bald.*

M.D., New York.

Answer.—There is no harm in wetting the hair daily. It is entitled to the same care that one gives the face. A wet scalp, however, is prone to attract dirt.

CONGENITAL SYPHILIS

To the Editor:—*On page 77 of the May 5, 1951, issue of* The Journal *is a question and answer regarding congenital syphilis. The answer is completely in error. The doubtful cord serologic test is almost certainly due to transfer of maternal reagin. A saddle nose in a newborn infant is of no significance —they all have saddle noses. Under no circumstances should this infant have been treated for congenital syphilis until the diagnosis was established by the appropriate measures, which are outlined in any standard text on syphilology.*

J. E. Moore, M.D.,
803-807 Medical Arts Bldg.,
Baltimore 1.

To the Editor:—*I do not fully agree with the answer to the query on "Congenital Syphilis" in* The Journal, *May 5, 1951. The infant may or may not have congenital syphilis, but certainly that diagnosis cannot be assumed in the absence of clinical manifestations and equivocal cord serologies. A single positive cord serology cannot be accepted either as final elimination or confirmation of infantile syphilis. If a steadily rising titer in quantitative Kahn tests is found on weekly or semimonthly examinations for three months in the absence of clinical manifestations, then the infant probably has congenital syphilis and treatment can be given. Also, if x-ray of the long bones reveals osteochondritis, then the infant probably has syphilis.*

J. M. Greenhouse, M.D.,
206 Metropolitan Bldg.,
435 Missouri Ave.,
East St. Louis, Ill.

To the Editor:—*In Queries and Minor Notes in* The Journal *of May 5, 1951, is a letter requesting advice on the management of an infant born of a treated syphilitic mother. The consultant's opinion that the baby is "probably syphilitic" and should be immediately treated with penicillin is erroneous. It is now recognized that many nonsyphilitic infants born of syphilitic mothers are seropositive at birth and become seronegative in the course of the first few months of life. In the absence of clearcut clinical or roentgenologic evidence of syphilis, the diagnosis must not be made purely on serologic grounds under the age of 3 months. Since the mother in question had received treatment and was seronegative and the cord blood showed only a minimal amount of reagin, it is highly probable that this infant does not have congenital syphilis.*

The proper course would be to examine this baby clinically and serologically at intervals of two to three weeks and to x-ray the long bones in search of evidence of syphilitic osseous disease. Should the clinical and roentgenographic examinations remain negative and should the serologic test change to negative in the absence of antisyphilitic treatment, congenital syphilis could be excluded in this child by the age of 4 months.

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To the Editor:—*I disagree with the answer to the query on "Congenital Syphilis" in* The Journal, *May 5, 1951. The flat statement that a newborn infant with a positive cord serologic test for syphilis (and in this case the result was doubtful), born of a mother who presumably has inadequately treated latent syphilis, "probably" has syphilis is absolutely incorrect. It has been proved that maternal syphilitic reagin may appear in the blood of nonsyphilitic infants for varying periods after birth and that the results of the cord serologic test are of little importance. When positive, the test may be merely evidence of maternal rather than infant infection. The serologic test on cord blood is worthless as a working diagnostic tool, because in a child with a negative cord reaction to a serologic test for syphilis the signs of congenital syphilis may ultimately develop, and a child with a positive cord reaction may ultimately prove to be nonsyphilitic. Furthermore, once treatment for congenital syphilis has been given, the child must be considered as having had congenital syphilis for the rest of his life, even if the diagnosis might have been in error. In an apparently normal, healthy infant, there is no need to rush into therapy, as was advised, until the diagnosis is definitely established.*

Definitive diagnosis can be aided by the use of serial roentgenograms of the long bones, although, owing to artifacts and misinterpretations, these studies can be considered as only about 25% accurate. However, serologic tests for syphilis done weekly in a serial manner on the infant's blood can give an accurate estimation of the infant's syphilitic status. The quantitative titer of the infant's blood is usually equal to, or lower than, the titer of the maternal blood, and the titer subsequently falls and the reagin finally and permanently disappears in the first few weeks of life. In such infants, subsequently observed, other evidence of congenital syphilis does not develop, thus demonstrating the maternal origin of the reagin, which usually disappears in the first month of life. If by the twelfth week one finds increasing amounts of reagin in the infant's blood, the child can be considered as syphilitic. The presence of reagin, therefore, at the end of the third month is indubitable evidence that the child is syphilitic.

The presence of reagin of maternal origin in an infant's blood is more readily detected by a complement-fixation test than by a flocculation test, and for this reason the routine use of the flocculation test is recommended in infants suspected of having circulating maternal reagin rather than congenital syphilis. Associated with increasing amounts of reagin in the circulating blood of the congenital syphilitic child is the usual development of definite clinical signs of syphilis, such as dark field positive cutaneous lesions, bullae, snuffles, and periosteal bone lesions.

In regard to the mother, although the basis on which the diagnosis of syphilis was originally made is not stated, we must consider her as having syphilis, since treatment was instituted and was inadequate. Certainly, an examination of the cerebrospinal fluid is indicated in the immediate future, before or at least in the first week of therapy, and repeated a year later. The total penicillin dosage as given (6,000,000 units) is adequate for early and latent syphilis, but, assuredly, around 10,000,000 units should be given for central nervous system syphilis, and a cerebrospinal fluid examination is indicated to determine whether central nervous system syphilis exists. It should never be presumed that a negative blood serologic reaction means that the spinal fluid is normal.

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TREATMENT OF COMPOUND FRACTURES IN THIS ANTIBIOTIC AGE

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Since one of the chief objectives in the treatment of compound fractures is to prevent or combat infection in the wound, and since the introduction of antibiotics has profoundly influenced treatment of infections in general and of the pyogenic infections in particular, it seems in order to review the treatment of compound fractures in the light of the present day knowledge of antibiotics and the facility with which these potent agents can be used. In connection with some other work, I recently sent a questionnaire to a group of 24 orthopedic surgeons, in which I inquired about their use of antibiotics and other measures in the treatment of compound fractures. I found that there are wide differences of opinion concerning the dosage of antibiotics as well as minor differences on other phases of the treatment of these injuries.

Since compound fractures are among the most frequent and important injuries that man is heir to in time of peace as well as in time of war, it is evident that an effort should be made to standardize the treatment of these grave injuries. However, not only is there considerable variation in the character and severity of the lesions present and in the degree of contamination of the wound, but there is also considerable variation in the conditions under which the wound will be treated and in the capability of the surgeon who is to administer the treatment. Consequently, it is hardly possible to standardize the treatment of these injuries, but it is possible to present a method of treatment that is reasonably elastic and thus capable of modification in the hands of the individual surgeon and yet to offer a procedure that will yield a satisfactory result in a high percentage of the cases. This paper is an attempt to present such a method.

EMERGENCY TREATMENT

A compound fracture is nearly always a serious injury and will necessitate surgical treatment. In most instances the patient should be admitted to the hospital if one is available within a reasonable distance from the site of the accident and if transportation to the hospital is possible. At the site of the accident the treatment will vary with the severity of the wound and the condition of the patient. The injury may vary from a laceration with fracture of the terminal phalanx of a finger or toe to an injury of the utmost gravity, in which the patient is either killed outright or in which his life is in imminent danger. At the site of the injury the extremity should be straightened and gross deformities reduced by manual traction, and this traction may be continued until a temporary splint has been applied. The wound should be covered with a clean dressing. If possible, this should be a sterile dressing. If such is not available, a clean piece of cloth may be applied to the wound and bound on with a suitable bandage. If hemorrhage is present and of sufficient degree to demand attention, efforts should be made to control the hemorrhage either by means of a pressure dressing or of a tourniquet. If necessary, a tourniquet can be improvised. If sulfonamide powder is available, this may be sprinkled in the wound before the dressing is applied.

The question then arises as to whether or not the fracture should be splinted by rigid external fixation on the spot, and there are many surgeons who believe that the old dictum "splint them where they lie" should be applied to the treatment of every compound fracture, regardless of the gravity of the wound or of the distance over which the patient must be transported before he reaches a hospital where definitive treatment can be administered. Common sense should determine the cases in which splinting should be done before the patients are moved from the scene of the accident. In civilian life most injuries occur in situations in which the patient can be taken to a hospital and in which the journey will require less than one hour; consequently, it is not necessary to apply rigid splints to every compound fracture. Such splints need be applied in only those cases in which transportation without splinting will be very painful or increase the damage to the soft tissues and thus promote shock and hemorrhage. This applies especially to fractures of the femur and of both bones of the leg and to severe fractures and fracture dislocations at the ankle and of the arm or forearm. In some instances a fractured upper extremity can be supported on a pillow or the arm and forearm can be bound to the chest, and a fractured lower extremity can be bound to the opposite lower extremity if necessary. Likewise, all patients with frac-

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From the Department of Surgery, Washington University School of Medicine.

Read at the Fourth Clinical Session of the American Medical Association, Cleveland, December 8, 1950.

tures, except the severe ones mentioned above, can usually be transported with relative safety in an automobile. Persons with major fractures of the lower extremity should be permitted to lie where they are until an ambulance can be sent for and they can be transported in a recumbent position. In case of doubt, splints should be applied and an ambulance should be used.

Usually it is not necessary to give any antibiotics at the site of the accident because this type of treatment is better given at the hospital, where a record will be kept of the drugs that have been administered. On the other hand, if it is known that considerable time will elapse before definitive treatment is instituted, it is well to give a severely injured patient a single large dose of penicillin —not less than 100,000 units and, preferably, 400,000 units, of penicillin G procaine fortified.[1] The same policy should be followed for sedation. If the patient is suffering a great deal of pain and morphine or another sedative is available, it should be given in a dose sufficient to make the patient relatively comfortable. This not only will relieve pain but will also tend to lessen shock. Some object to morphine in the presence of brain injury, but it may do more good than harm.

TRANSPORTATION

The patient should be taken as soon as possible to a hospital where expert treatment is available and will be given. As stated above, he should be transported in an ambulance if he is suffering from a major fracture of the lower extremity. Otherwise, he can usually be moved more expeditiously in an automobile. He need not be taken at breakneck speed, as minutes are less important than is avoidance of roughness in transport and in handling the limb.

ADMISSION TO THE HOSPITAL

The patient should be admitted to the hospital as an emergency case with as little "red tape" as possible. He should not be taken to the x-ray room immediately, but should be left in the emergency room or put in a comfortable bed and examined by a competent surgeon who has had sufficient experience and judgment to enable him to evaluate other injuries, such as those to the head, chest, and abdominal and pelvic viscera, and the general condition of the patient. If the patient is in a condition of surgical shock or if shock is impending, this is the major consideration and efforts should be made immediately to combat the shock with the usual measures: elevation of the foot of the bed, rest, application of external heat, and replacement of blood by plasma or fluids and then whole blood, as necessary. If he has lost much blood, it should be replaced as soon as possible. Also, he should be relieved of pain. If his wound is not properly dressed, a proper dressing should be applied, and, if indicated, the fracture should be immobilized either by traction or by a splint. Oxygen may be administered if it is indicated. If hemorrhage is present, it should be arrested by suitable means—tourniquet, clamp or pressure dressing. The patient should be kept warm, quiet and comfortable while in shock. He should be given a large dose of penicillin as soon after admission as possible if it has not been administered elsewhere.

If the wound is covered by a satisfactory dressing, it should not be disturbed until the patient is in the operating room and ready for definitive treatment. An effort should be made to determine all injuries present as well as the time that has elapsed since the injury occurred; the time should be recorded because in a case of compound fracture the number of hours elapsed between the injury and the operation is an important factor in determining the method of procedure. If the patient is not in a condition of shock, he should be taken to the x-ray room as soon as an adequate history and physical examination have been completed. The blood count and typing for transfusion, if the patient is sufficiently injured to warrant this, should be done as part of the physical examination. Unless the fracture is suitably splinted, splints should be applied before the patient is sent to the x-ray room, since the usual x-ray technician is not qualified to manipulate an extremity in which there is a fresh fracture unless it is adequately splinted.

PREOPERATIVE TREATMENT

It is well to give a dose of morphine or other sedative as soon after the patient has been admitted as possible if this has not been done previously and is indicated. Likewise, the patient may be given 100,000 to 400,000 units of penicillin and 3,000 units of tetanus antitoxin or a booster dose of 1 cc. of tetanus toxoid if he has been immunized. These should be given and recorded if they were not given before admission.

He should be taken to the operating room as soon as is practicable. A few minutes are not important, but hours may be; this is especially true if six hours or more has elapsed since the time of the injury and the patient's admission to the hospital. If shock is present, x-rays may be made while the patients is in bed after he has begun to react from the shock, or they may be made in the operating room after the patient is on the operating table.

TREATMENT IN THE OPERATING ROOM

The patient should be placed upon either a regular operating table or a fracture table before the dressings and splints are removed. If the fracture involves the femur or both bones of the leg, it is especially desirable that he be placed on a fracture table and that traction be applied to the extremity in order that it may be supported in a position suitable both for operation and for the application of a plaster cast after the operation is finished.

Administration of the anesthetic is usually begun before the operative field is prepared. My associates and I usually use general anesthesia, but local, regional or spinal anesthesia may be used by those who are especially equipped to do so and are skilful in the use of these methods. A severely injured patient may be given plasma or blood before, during and after the operation as indicated by his general condition.

After the patient has been anesthetized, the dressings are removed, the extremity is placed in a suitable position for the operation, and the surrounding skin over a sufficiently wide area is scrubbed with soap and water (we now use one of the new antiseptic soaps, septisol®

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[1] Each cc. of penicillin G procaine fortified contains 300,000 units of procaine penicillin G and 100,000 units of potassium penicillin G crystalline with 2% aluminum stearate w/v in sesame oil.

or pHisoderm,® which contain solution G 11 [hexacloro-phene]). The skin is then shaved, and the scrubbing is continued until it is clean. It is then rinsed with sterile water or salt solution and wiped dry, then washed with ether, and iodine tincture or some other skin antiseptic is applied. During the preparation of the skin, the wound is covered with a sterile dressing and the washing and shaving are extended up to the edge of the wound. The wound may then be flushed with isotonic sodium chloride solution before the skin is dried and the skin antiseptic is applied. If the skin preparation has been done by the surgeon, he should now change his gown and gloves. The field is then draped and the operation of débridement of the wound and reduction of the fracture is performed. If the circulation distal to the fracture is adequate, an effort should be made to save the extremity.

DÉBRIDEMENT

The operation of débridement has as its objective the removal of devitalized and contaminated tissue and foreign material from the wound in order that it may heal without becoming infected. The manner in which it is performed varies considerably in different clinics. One surgeon may open the wound widely and remove little or no tissue, while another may perform a wide block excision of the wound, and there are all variations between these extremes. We believe in a conservative débridement, in which the margins and contaminated surfaces of the wound are excised and foreign material is removed. The wound is débrided in layers, but this is done with the sacrifice of as little viable tissue as possible. This requires a careful excision of the wound, layer by layer, care being taken not to force contaminated tissue into the depths of the wound by injudicious retraction or exploration. These statements do not apply to wounds that are more than 24 hours old, have not been adequately protected by sulfonamides or penicillin and are infected. These wounds are opened and washed thoroughly; necrotic material and foreign bodies are removed, and the wounds are then packed loosely with petrolatum gauze, and no effort is made to excise their infected surfaces.

In dealing with through-and-through wounds such as those caused by shell fragments or other missiles, both the wound of entrance and the wound of exit are débrided, the latter necessitating the more extensive operation. An exception is a compound fracture caused by a high velocity missile such as a rifle or machine-gun bullet. These wounds tend to be relatively sterile, and débridement is not necessary. The skin edges may be excised and the skin sutured, or the wounds may be painted with a skin antiseptic and covered with a sterile dressing and the fracture treated as a simple fracture, except that penicillin is given as in the postoperative care of compound fractures. In case of multiple wounds only the major ones are débrided.

The operation of débridement is performed either with or without a tourniquet, depending upon the location of the injury, the condition of the patient and of the extremity and the wishes of the surgeon. We usually use a pneumatic tourniquet, and this is released when the operation is finished and before the wound is closed or the pressure dressing is applied. Early in the operation the wound is inspected and material for culture obtained, usually with a cotton swab, from the depths of the wound; or some bits of devitalized tissue, especially muscle, are excised and implanted in suitable mediums. These cultures are especially valuable for the early detection of gas bacillus contamination and for determination of the penicillin resistance of bacteria in the wound.

The margins of the wound are excised, with removal of as little living skin as possible, usually a thin strip about ⅛ in. (0.3 cm.) wide entirely around the wound. Large, loose flaps of skin are saved when possible. However, skin should be excised if it has been subjected to crushing and is consequently thinned and obviously devitalized as well as soiled by dirt that has been ground into it. Although it is important to conserve as much skin as possible, it is not advisable to save skin that is dead and will slough and become infected. The knife and forceps that have been used in excising the margins of the wound are discarded.

The wound is then enlarged, usually by vertical incisions both upward and downward in such a manner that the edges can be retracted and the depths of the wound inspected. As the wound is inspected, any gross foreign bodies that are seen are removed. Blood vessels that are bleeding or that may bleed later are clamped and tied with fine absorbable surgical suture or silk as they are encountered. The wound is then irrigated gently with isotonic sodium chloride or sulfonamide solution and the subcutaneous and deeper tissues are débrided by excision of a thin layer of the surfaces of those tissues which were exposed in the wound. When dirt or other foreign material is embedded in the tissues, especially the loose areolar tissues, excision is preferable to an attempt to pick out the foreign material. Devitalized muscle is removed. This is muscle that is crushed, has lost its structure, is swollen, and does not bleed or retract when cut. On the other hand, much contused but viable muscle may be present in severe compound fracture wounds, and this muscle may be dark in color and swollen without being devitalized; usually this muscle should be allowed to remain. It is important to avoid removal of muscle that can be expected to live and resume its function. On the other hand, masses of dead muscle left in a wound will almost always lead to infection, and this cannot be prevented by the use of antibiotics. The débridement is as atraumatic and conservative as is consistent with a satisfactory operation.

If a joint cavity communicates with the wound, the margins of the capsule and synovial membrane extending around the wound and into the joint are excised, the cavity is thoroughly irrigated and inspected and foreign particles or loose pieces of bone or cartilage are removed. Contused or soiled cartilage is excised. If necessary, the opening into the joint is enlarged to permit inspection of the cavity. After it has been débrided and thoroughly irrigated, the joint cavity may be closed loosely, either with or without drainage.

The bone is now inspected, and completely loose fragments of bone are removed, although very rarely a single large fragment that is loose may be washed off and replaced for use as a graft or internal splint in order to preserve continuity and length of the shaft. All fragments of bone that are sufficiently attached to soft tissues to have a reasonable chance of surviving are left in the wound unless they are grossly soiled. The ends of the fragments are not removed unless they are grossly contaminated by dirt or other foreign material. If such material is ground into the bone or forced into the medullary canal, the ends of the fragments must be excised until only clean bone is left. When this is done, it is usually advisable to shape the ends of the fragments so that the fracture will be relatively stable when it is reduced and immobilized in a cast.

An exception to the above is in epiphyseal separations in which the end of the shaft has been forced into the dirt. We have hesitated to excise the end of the shaft for fear of interfering with growth; consequently, the epiphyseal end is scrubbed thoroughly with soap and water, usually by means of a sterile brush, then irrigated and replaced in the wound, only small portions that still contain dirt being excised with rongeur forceps.

The wound is again inspected, and a further search is made for any remaining foreign material or devitalized tissue in the wound. But the tissues are not widely opened in order to search for deeply buried missiles. These can be removed later if necessary. The ends of tendons and nerves that have been cut or torn are excised by a clean transverse section, and these tendons and nerves are then repaired, usually with fine silk if the condition of the wound and the patient permit. If for any reason haste is imperative, they may be simply tied together with fine silk or, preferably, with a stainless steel wire suture. The bodies of cut or torn muscles are united by widely spaced mattress sutures pulled just tight enough to coapt the ends, care being taken that all devitalized muscle is removed before the sutures are placed.

Reduction and Fixation of the Fracture.—The débridement and repairs having been completed, the displacement of the fragments is reduced as accurately as possible by traction and manipulation, and a decision is made as to whether or not internal fixation should be used. Since the advent of antibiotics and noncorrosive metals, internal fixation of compound fractures has been used with considerable success in a large number of cases. It offers the advantage of more complete immobilization of the fragments; this lessens the danger of postoperative trauma and of the development of dead spaces in the wound and thus lessens the danger of infection. On the other hand, the application of internal fixation, especially of screws, plates and medullary nails, adds to the trauma to the bone and further impairs the circulation of the bone. The same is true, to a lesser extent, of wires.

If internal fixation is not vitally needed, it should not be used. However, in fractures in which internal fixation will be of great advantage it may be used, and this is especially true in relatively fresh compound fractures that have been satisfactorily débrided and can be cared for by the surgeon after the operation. In fact we much prefer this to external skeletal fixation with multiple pins and, usually, to treatment by skeletal traction, as it saves time in the hospital.

A substitute for internal fixation is external skeletal fixation. This is provided by two Steinmann pins, one in the proximal and one in the distal fragment. These pins are applied after the operation is completed but usually before the wound is closed. It is advisable not to place them in the operative wound, but to insert them through intact skin and soft tissues. If reduction of the fracture is maintained until the cast is applied, these pins will usually insure that the fragments will not slip in the cast and they will always prevent shortening in the cast. The wound is again inspected and irrigated, not copiously but adequately, any further devitalized tissue is excised, and any further foreign material that can be identified is removed. For this final irrigation we use a saturated solution of sulfanilamide. The tourniquet is now removed, and any bleeding vessels that have been overlooked are ligated.

Closure of the Wound.—The next question is whether or not this wound should be closed. This will depend upon (1) the time that has elapsed since the accident, (2) the degree of soft tissue damage, (3) the amount and character of the soiling of the wound, (4) the ability of the surgeon to perform a satisfactory débridement, (5) whether or not it is possible to close the wound without too great tension, and (6) the postoperative care that the patient will receive. The decision is based upon the surgeon's experience and judgment, and it may be a very delicate one. We have successfully closed several wounds more than 24 hours old but do not advise this as a routine procedure even when the patient has received antibiotic therapy from the time of the accident.

In civilian life most compound fractures can be closed because they are seen relatively soon after the accident, the surgeon can keep in close contact with the patient after the operation, and it is not necessary that the patient be transported to another hospital after the operation.

In military life, and especially in war and under campaign conditions in which the skin is apt to be dirty before the injury is received and foreign material is apt to be carried deep into the tissues by the missile in shell or bomb injuries—especially when the patient is likely to be moved to another installation and cared for by another surgeon after the operation—the wound should be left open and closure attempted later by primary delayed or secondary closure.

If the wound is to be closed, the skin and subcutaneous tissues are approximated with a single layer of rather widely spaced sutures of chromicized absorbable surgical suture, silk or silkworm gut, depending on the choice of the surgeon. If such tension is present, this may be relieved by lateral incisions on either side of the extremity, thus permitting the skin to slide toward the wound, and, if necessary, these incisions may continue down through the subcutaneous tissue and even the deep fascia, and the defects may be covered with petrolatum gauze and permitted to heal by granulation, or a split thickness skin graft may be applied immediately. After the wound is closed, 100,000 units of penicillin is injected into the depths of the wound or into the joint if it is involved.

In some instances it is necessary to swing a flap of skin and subcutaneous tissue across the wound. When this is done, it is important that the flap have a sufficiently wide base and that it be sutured in position without tension and without constriction of the base, otherwise, it may slough and further complicate the condition of the patient. A definite effort should be made to cover nerves, tendons, and bones that are exposed in the wound.

In many instances, and especially in those in which, after débridement, there is a dead space or in which there has been extensive damage to the soft tissues, it is advisable to drain the wound for at least 48 hours. This is accomplished by a stab wound in the dependent portion of the wound. This stab wound is made sufficiently large so that a soft rubber tube or tissue, or a petrolatum gauze drain of adequate size can be passed through it to conduct fluid from the depths of the wound to the dependent surface of the extremity. Do not use through-and-through drains. In a wound involving a joint the synovial membrane can be closed loosely and the drain carried down to the membrane, or the end of the drain may enter the joint cavity, but drains should not pass through the cavity. If the wound is to be closed, the joint capsule and any ligaments that are cut or torn should be repaired. The drain should usually be removed in 48 hours and this removal can be accomplished through a small window in the cast.

If the wound is to be left open, it is packed loosely with gauze impregnated with petrolatum or preferably with fine mesh gauze impregnated with glycerin. The packing must be loose, otherwise it may act as a plug in the wound and promote infection. A pressure dressing is then applied. Pressure dressings are also used for the wounds that are closed but are especially desirable in those which are not closed. It consists of a mass of cotton waste or fluffed gauze (or, if this is not available, a rather heavy dressing of ordinary surgical gauze or cotton) that is bound onto the extremity with a gauze or woven elastic cotton (Ace® or tensor) bandage. Care is taken not to apply the bandage too tightly because it is important not to interfere with the circulation of the distal portion of the extremity. On the other hand, it should be tight enough to exert definite pressure and thus tend to prevent postoperative edema of the tissues as well as the accumulation of fluid beneath the skin. The extremity should be inspected at intervals, and, if at any time the circulation appears inadequate, the cast should be bivalved and the dressing loosened or split. It is our custom to use the pressure dressing whether the wound is left open or closed, and in case of doubt we are disposed to leave the wound open and to close it at a later time by either a primary delayed or a secondary suture, if possible. If this is not feasible, we may use skin grafts to cover the denuded area or may let the wound heal by granulation.

External Fixation.—After the pressure dressing has been applied, the extremity is immobilized in a splint with or without traction or in a plaster cast. In major fractures of the lower extremity that are to be immobilized in a splint with traction, the limb is supported on a Thomas knee splint or on one of another type, and skeletal traction is applied by means of a wire that is drilled through a suitable portion of the femur, tibia or os calcis. When traction is used on compound fractures in which the muscle has been severely damaged or destroyed, it is well to remember that considerably less weight is necessary than for a similar limb in which the muscles are intact; otherwise, serious distraction with delayed union or none may occur.

Most compound fractures are immobilized in plaster of Paris casts. When a cast is to be used, the pressure dressing and the extremity are wrapped in a layer of sheet cotton and the whole covered by the plaster bandage. Unpadded casts are dangerous in these injuries and are to be used only by those who are expert in this form of treatment. Care is taken to avoid displacement of the fragments during the application of the cast. The cast should be adequate for fixation of the part: a shoulder spica for injuries of the elbow, arm or shoulder and a hip spica for injuries of the hip, femur or knee. A plaster cast may also be used in the convalescent care of fractures that were treated by traction until the fragments began to unite. If necessary, one or more windows may be cut in the cast in order to permit dressing the wound.

Primary Delayed Suture.—Those wounds which are left open after débridement, but which are relatively clean, can in most instances be closed within from four to 10 days after the original débridement by a primary delayed suture. This is a simple closure of the wound without excision or undermining of the skin margins or excision of the surface of the wound. It is important that the wound be either sutured or covered with a skin flap or graft as soon as possible after the injury, as the successful closure of the wound converts the lesion into a simple fracture and this greatly simplifies the treatment.

Both primary delayed and secondary sutures are now performed without bacteriological control. It has been found that, with the aid of antibiotics, wounds that present a satisfactory appearance when the dressing is removed can be closed with relative safety. If, when the dressing is removed, bits of necrotic tendon, fascia or other tissue are found in the wound, these can be excised and the wound washed out, and if the latter looks clean it can then be closed with relative safety by simple interrupted sutures that draw the skin together. If this cannot be done without so much tension that the circulation is interfered with, it may be possible to close the wound by a plastic procedure (by sliding or shifting flaps of skin and subcutaneous tissue or by doing a split-skin graft). Tendons, nerves and bone should be covered if possible. When plastic procedures are used, denuded areas may be covered with a split-skin graft, and from that time on the injury is treated as a compound fracture that has been closed at the time of débridement. In many instances it is possible and wise to do the primary delayed suture through a window in the cast, thus avoiding the danger of displacing the fragments, and the same is true of secondary suture, though this is a more extensive procedure and may require a larger window.

Secondary Suture.—If for any reason the wound cannot practicably be closed by primary or primary delayed suture, it may be permitted to heal by granulation or be closed by secondary suture. The secondary suture is a more extensive procedure than the primary delayed suture because it is frequently necessary to excise not only the margins of the skin that have begun to grow over the wound, but also the surface of the wound itself and to undermine the skin edges in order to bring them together. Since more time has elapsed since the original injury, there is not so much danger of displacement of the fragments in a secondary wound closure as there is in a primary delayed suture. After the secondary suture the wound is immobilized in a plaster cast and treated as though it were a simple fracture. If the position of the fragments is not satisfactory, it can be corrected at the time of the primary delayed or secondary suture.

Postoperative Treatment.—If the patient has not received adequate protection from tetanus before the operation this should be attended to as soon as is practicable after the operation. The chemotherapy usually begun before the operation is continued afterward as long as necessary. We usually give a single dose of 300,000 units of penicillin G procaine or a fortified dose containing 100,000 units of soluble penicillin and 300,000 units of penicillin G procaine daily after the operation. In very severe cases in which there is unusual risk of infection this dose may be doubled, or, if the surgeon prefers, the patient may be given 100,000 units of soluble penicillin intramuscularly every two or three hours for the first few days until the danger of invasive infection is passed, then the dose can be decreased. This procedure is continued until the temperature has been normal for five to seven days.

As a rule we do not use any of the other antibiotics, i. e., aureomycin, terramycin, streptomycin, and chloramphenicol (chloromycetin®), unless it is found that the organisms that contaminate the wound are resistant to penicillin and unless gram-negative bacteria have been detected in the wound or the patient is not doing well on the penicillin. In that case we may shift to one of the other antibiotics or continue with the penicillin accompanied with the other drug. There are now available vials containing 300,000 units of penicillin G procaine, 100,000 units of buffered penicillin G, and 1 gm. of dihydrostreptomycin, all of which can be administered in a single 3-cc. aqueous injection. It is possible that the use of combinations of penicillin with one or more of the other antibiotics for the prevention of infections in compound fractures will be routine in the future. At present we use only the penicillin unless there is a specific indication for the use of some other antibiotic.

If the patient is in shock, this condition should be treated with the usual methods, special attention being paid to restoration of the blood volume. If the patient is anemic, he should be given transfusions until his red blood cell count has reached an approximately normal status. He should also be put on a high-protein diet. If the patient complains of excessive pain, if the pulse rate is unduly accelerated or the temperature is unduly elevated, the cast should be bivalved or a window cut to expose the wound, which should be opened, or the packing removed, if necessary, to permit adequate drainage. If gas bacillus infection occurs, appropriate surgical treatment should be instituted as soon as possible. If the circulation in the extremity is insufficient on account of traumatic vascular spasm, an effort should be made to relieve this condition by blocking the lumbar sympathetic chain with procaine hydrochloride (novocaine®).

The postoperative care of the fracture is similar to that of a simple fracture of the same type, except that in a compound fracture the bones may heal somewhat more slowly than in a simple fracture. If further surgery in the wound is indicated, whether for the purpose of restoring continuity of nerves or tendons, for plastic procedures on the skin or soft tissue or for procedures on the bone, it can now be done as soon after the injury as the healing of the wound will permit and one no longer has to wait for a period of many months for the disappearance of any latent infection in the wound, because this condition can usually be controlled with antibiotics. Restoration of function in these patients is carried out along lines similar to those used in the treatment of simple fractures, except that in compound fractures the immobilization may have to be continued for a longer time and there may be soft tissue injuries that add to the disability.

It is thus evident that the advent and general availability of potent antibiotics have improved the results but have not greatly altered the treatment of compound fractures. These injuries must still be treated promptly, and shock must be combated, as in the past. Likewise, the wounds must be débrided carefully, and, if they are closed by primary suture, it must be effected without excessive tension, and they must be watched carefully afterwards.

With the aid of antibiotics we are permitted a little more leeway as regards the elapsed time during which a given wound may be closed and are able to use internal fixation more freely than in the past. The principal benefit that can be attributed to these agents is the ability of the surgeon to perform immediate closure or primary delayed suture on most wounds and to cover others with split-skin grafts and thus obtain prompt healing of many wounds that in the past would have been doomed to months of chronic infection with resultant loss of function of the part. It is to be noted, however, that the antibiotics do not perform miracles in compound fractures and that the successful treatment of these injuries demands the same high degree of surgical judgment and skill that it did before these agents were available.

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Neutromuscular Transmission.—The general acceptance of the acetylcholine theory in neuromuscular transmission is based not only on the overwhelmingly positive evidence, such as, for instance, that acetylcholine is released on motor-nerve stimulation, that injections of acetylcholine can imitate all details of motor-nerve stimulation, and that there is at the neuromuscular junction a concentration of the enzymes which synthesize and destroy acetylcholine; but also on what I may call the negative evidence—that is, whenever the possibility existed to try out whether the nerve impulse could cause contraction without acetylcholine the answer was no, the nerve impulse was unable to do so.—W. Feldberg, M.D., The Physiology of Neuromuscular Transmission and Neuromuscular Block, *British Medical Journal*, May 5, 1951.

ACCELERATION OF CONVALESCENT CARE OF POLIOMYELITIS PATIENTS

Charles L. Lowman, M.D., Los Angeles

In the convalescent phase of poliomyelitis, the problem of delay in definitive treatment with its resultant personal and economic hardship must be faced. Early in the course of each case, the paralytic patient and his parents should be given comprehensive understanding of the aims and sequence of treatment and the need for establishment of a streamlined tentative over-all care program. This will not only increase the patient's understanding of the problems ahead but, if sincere effort is made to shorten convalescence, will also save him time and money.

The tendency has been great to follow the old teaching that continuous muscle reeducation should invariably be continued over a period of one to two years even though the need for early surgical intervention is clearly indicated. Parents naturally wish to avoid surgery, and sometimes it is possible to continue muscle training for a considerable period with a chance of recovery. But when early surgery is clearly indicated, it in no way jeopardizes outcome. In fact, it frequently wards off deformity and improves the ultimate result.

Through the program of the National Foundation for Infantile Paralysis, extension of aid to thousands of children and adults who have been stricken with poliomyelitis has been made possible. The policy of the foundation and its 2,800 or more chapters has been to spare no expense in seeking a preventive, and to provide care for victims of the disease. But now after the severe epidemics and drain on the resources of the foundation during the last few years, it may be well to consider whether or not certain economies may be practiced without detriment to any individual patient.

Little can be done to shorten the time of the acute febrile phase of the disease in the general hospital contagious ward, but great economy can be effected if patients can be released from isolation care, as is now generally felt to be safe, at the end of one week or when fever ceases. This would permit earlier discharge for outpatient follow-up of the almost 50% of patients who recover without significant weakness or paralysis and permit great reductions in expenditures for hospital care. Of course, early institution of good care during the isolation period will also do much to hasten recovery.

In the hospitals where treatment is given in the subacute, convalescent, and reconstructive stages, economy may be considered in three aspects: (1) financial; (2) time or manhours of work; (3) time saved for patient. For patients needing assistance, hospital costs have been borne wholly or in part by the local foundation chapter. The patient is treated in the inpatient department (weeks, months, and not infrequently for years) at an average daily cost of $13.00 to $20.00. He is then referred home and returns to the outpatient department for physical therapy and medical care, which, at an average cost of $3.00 a visit, extends for many weeks or months. Chapter treasurer's report for Dec. 31, 1948, showed $822,185 expended during the year for wheel chairs, crutches, transportation, braces, and similar items, or about 6.9% of the total spent. This does not cover epidemic nursing or the length of nursing service. Patients often are continued on physical therapy one to two years before surgical reconstruction is attempted or even recommended.

REEXAMINATION AND RECOMMENDATIONS

In my opinion, reexamination should be made of the usual method of giving physical therapy treatment for 12 to 16 months before surgical steps are taken. Instead a tentative plan of total care should be made for each patient. This should extend from the hot pack and passive motion stage through all aspects of therapeutic exercise, bracing, surgical reconstruction, and vocational training.

A thorough evaluation of performance, especially in relation to trunk muscle imbalances, should be made. Study of the muscle checks of 1,767 cases in the follow-up survey made by Dr. Robert Carroll of poliomyelitis patients from 1939-1942 and carried on under one of the earliest foundation grants shows that the recovery curve usually starts toward a plateau at the sixth month and flattens out about the eighth month. Occasionally, muscles show further improvement for six or eight more months. This report is in the files of the National Foundation for Infantile Paralysis and is outlined in a paper published in 1942.[1] As far as I know, it constitutes the largest study of its kind to date.

It is important to note whether the muscles showing improvement are those of the essential fixators which comprise the bases from which the intrinsic muscles of the legs and arms function. Essential for stabilization in the legs are the gluteals, quadriceps, and gastrocnemius, and in the trunk, the abdominal and lower spinal muscles. The abdominal musculature must be intact for stabilization of the pelvis in relation to the thorax and lower spine. The status may be determined by discovery of whether a positive Beevor's sign is present. If the umbilicus moves toward a viable segment of the abdominal musculature, positive fixation of the pelvis is lacking. If no action at all is present in the abdominal muscles, stabilization is also lacking. In the presence of either condition, it is impossible to estimate correctly the action of the leg muscles in relation to total performance. The use of physical therapy over a prolonged period (even though some individual leg muscles show improvement) will not lead to the desired stabilization. In fact, con-

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Director of Education and Rehabilitation, Orthopaedic Hospital, and Emeritus Chief of Staff.

[1] Carroll, R. L.: Rate and Amount of Improvement in Muscle Strength Following Infantile Paralysis, Phys. Therapy Rev. 22:243-257 (Sept.-Oct.) 1942.

tinued training of leg muscles in the presence of such abdominal weakness only tends to increase the gap in the kinetic chain and to provoke trunk deformity. Similarly proper fixation in the shoulder girdle must be provided to give good performance of the upper extremities. There the rhomboids, lower trapezius, serratus, and deltoids are most important. Continuance of intrinsic training of arm muscles in the presence of paralyzed fixators of shoulder girdle is a waste of time. Performance will remain limited unless repair is made.

Early surgical intervention directed toward attainment of the all-important trunk fixation will not only shorten treatment time by many months, but will also hasten the date of maximum performance. When the signs mentioned above are clear, repair at any time from the third to fourth month is none too early. Such intervention will save the time spent in hospital or convalescent home and the time of all persons involved in the care of the patient. Cost of hospitalization and physical therapy will be sharply reduced.

It should be stressed that many operations, especially those involving invasion of growing bone, are advisable only when a roentgenogram demonstrates the appropriate time. But certain tendon transplants, soft tissue surgery, such as that in the hand to improve opponens function of the thumb, can safely be done early. Early operation should also be resorted to if indications are clear that deformity is impending. In the presence of strong overactive or normal opponents to weak or inactive muscles, conservative physical therapy treatment should not be long continued. The discrepancy cannot be overcome by such means. Electromyographic studies show that muscles graded zero, trace, or poor do not recover, even with two years of treatment.

The record on the muscle chart does not necessarily give a complete picture, and the parents must be given to understand that it is only a guide to be used in execution of the plan previously explained.

An example is a girl, 6, with a dangle foot and no quadriceps function. The child wore a full length brace with locked knee joint to prevent a contracture deformity at the knee. For six months the monthly muscle chart showed overacting hamstrings and no quadriceps function. Since hip joint control was good, I did a biceps-to-patella transplant. This permitted cutting down the brace to a short below-knee size to control the foot and changed stiff-legged action to hip and knee action. Three months after operation the child could go up and down stairs normally. Of what use would it have been to have continued this child on exercises for 12 to 16 months? It was evident from the beginning that this operation finally would have to be done.

Another example is a boy, 9, whose bone structure of the foot showed good development. Muscle checks continuously showed strong gastrocnemius and peronei but wholly inadequate anterior and posterior tibialis. By the eighth month the surgeon saw that a subastragalar stabilization followed by transplant of one or both peronei would be necessary. These operations were successfully done and months of unnecessary physical therapy avoided.

If the parents have been made to realize that a careful plan of total care has been set up which will save time, work, and funds for all concerned, they will accept more willingly desirable changes from one modality of treatment to another and be ready to cooperate when the recommendation for surgery is made. If they understand that a return to reeducational exercise after each surgical procedure will be necessary, they will realize that prolonged exercise before operation is a duplication of effort. If they also understand that operations devised to correct imbalances of essential basic fixators are vital to performance, they will accept more readily necessary operations to foster speedier improvement of function.

Auxiliary workers, particularly physical therapists, sometimes encourage unwise continuance of physical therapy, and since practitioners who are not well versed in the care of poliomyelitis patients depend greatly on the therapist's view of the case, the physical therapy phase may be continued over a wholly unnecessary amount of time.

As another economy, effort should be made to train parents, public health personnel, and volunteer helpers to take over some home physical therapy treatment of poliomyelitis patients. If a weekly or biweekly treatment is given by the physical therapist at the clinic, mild paralytic, paretic, and nonparalytic patients usually do well under supervised home care. Muscle checks each fourth to eighth week will show whether or not progress is being made.

SUMMARY AND CONCLUSIONS

My recommendations are (1) an over-all plan for the patient through all stages of treatment with evaluation of the physical therapy aspects of care; (2) a thorough evaluation of performance, especially in relation to trunk muscle imbalance and potential deformity factors; (3) early surgical reconstruction when necessary and advisable; (4) an all-around increased effort to conserve patients' and workers' time and personal and institutional funds by increase in the tempo of care of poliomyelitis patients to the highest point commensurate with careful consideration of the needs of each patient.

2417 S. Hope St.

Periarteritis Nodosa.—Perhaps the most serious allergic disorder, in that it accounts for most deaths, is periarteritis nodosa. This arterial necrosis occurs in a few cases of intractable bronchial asthma; it accounts for death from serum sickness and is caused frequently by drugs, particularly sulfonamides. Although in many instances no evidence of allergy is evident, its appearance both clinically and experimentally as an expression of hypersensitiveness identifies it as an important allergic disorder. Without doubt the disease is encountered far more frequently than heretofore. . . . Doubtless much of the increase in incidence of the disease is due to sulfonamide drugs and their indiscriminate use.—Harry L. Alexander, M.D., Allergy, in Medicine of the Year, Philadelphia, J. B. Lippincott Company, 1951, page 35.

TARSAL ANOMALIES AND PERONEAL SPASTIC FLATFOOT

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and
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Recent literature on the etiology of peroneal spastic flatfoot, especially by Harris and Beath,[1] has stressed the role of congenital abnormalities in this condition. Sloman[2] in 1921, and later Badgley,[3] observed the association of fusion of the anterior process of the calcaneus to the navicular bone with this condition, though anatomically the anomaly had been described earlier.[4] A second type of tarsal anomaly, namely, a union between the talus and the calcaneus in the region of the sustentaculum, has been held by Harris and Beath to be a commoner and heretofore unrecognized cause of rigid flatfoot. These authors reported a group of 17 cases of peroneal spastic flatfoot in which 88% were the result of tarsal anomalies. Twelve consisted of a talocalcaneal bridge in the region of the posterior end of the sustentaculum tali, and three were calcaneonavicular bars.

Since the above report was published, we have been taking special roentgenographic projections on all cases with peroneal spastic flatfoot. These consist of a posterior oblique view of the heel, with a downward and foreward projection angle amounting to 45 degrees for visualization of the sustentacular joint, and an oblique view of the midtarsal region to demonstrate the calcaneonavicular bar. These views are most important in addition to the routine X rays since the anomalies cannot generally be demonstrated without them. As a result we have found anomalies in 14 of the 21 cases of peroneal spastic flatfoot. Eight of these cases consisted of calcaneonavicular bars, four bilateral and four unilateral; four of a talocalcaneal bridge, three bilateral and one unilateral; and two of both of these anomalies, both of which were unilateral. Thus, tarsal deformity was the etiological factor in two-thirds of our cases. The frequency of these anomalies has been overlooked due to the requirement of special radiographic projections for their visualization.

The cause of most cases of spastic flatfoot has been explained on the basis of reflex peroneal muscle spasm secondary to some irritative focus of the tarsal joints.[5] Organic changes as a cause of spastic flatfoot in children generally have been considered uncommon. Certainly the association of bony abnormalities with spastic or rigid flatfoot has been completely ignored by the majority of authors, with only a few exceptions.[6] Rheumatoid arthritis with deformity and rigidity of the foot may early simulate spastic flatfoot, but it is a distinct entity. The common underlying cause of the usual spastic foot appears to be the presence of tarsal abnormalities and the fusion of the calcaneus to the scaphoid and to the talus. This is particularly true of resistant and recurrent cases, and careful examination of these feet reveals a limitation of mobility even after subsidence of the acute episode. It is true that because of the relative rigidity of the foot there is some adaptive shortening of the peronei, but definite evidence of peroneal spasm can usually be demonstrated in children when they have complaint. This is especially true in the type caused by the presence of a calcaneonavicular bar.

Many of these feet do not show depression of the longitudinal arch associated with valgus deformity, and in some even the valgus of the heel is absent, but the foot is relatively rigid and the forefoot everted. It has been a common previous observation that many of these so-called peroneal spastic flatfeet have not had a depression of the longitudinal arch and have frequently been unilateral. Most of such feet, we feel, would exhibit one or both of the tarsal anomalies here described if a thorough search were made for them.

THE CALCANEONAVICULAR BAR

This anomaly consists of a union between the anterior process of the calcaneus and the navicular. It may consist of a complete bone bridge (synostosis), a dense fibrous tissue bond (syndesmosis), or a cartilaginous bond (synchrondrosis). Pfitzner[4a] suggested that the anomaly resulted from fusion of a rare accessory tarsal bone, the calcaneus secondarius, to the calcaneus and the navicular. This anatomical study was published some 50 yr. ago.

Anomalies of this nature always exhibit restriction of lateral tarsal motion which may be proportional to the degree of osseous fusion. It is noteworthy, however, that the foot may not be flat in the sense that the longitudinal arch is flattened and the head of the astragalus depressed. The foot may be rigid though and held in valgus position due both to the anomaly and to the secondary peroneal spasm.

The onset of complaint is usually around the age of puberty or shortly before, during the active period of skeletal growth of the foot. As suggested by Badgley, the anomaly probably influences the functional structure of the tarsus most at that time. Generally these feet have manifested some degree of rigidity since early childhood. Minor trauma may initiate the symptoms of painful spasticity. Examination of these feet shows, in addition to the peroneal spasm and the limitation of inversion-eversion mobility of the forefoot, localized tenderness over the region of the calcaneonavicular bar. Rest will cause the

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From the North Carolina Orthopedic Hospital.

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This article has been abbreviated for publication in *The Journal* by omission of figures 1, 3, 5, 8, 10, 12 and 14. These will appear in the authors' reprints.

1. Harris, R. I., and Beath, T.: Etiology of Peroneal Spastic Flat Foot, J. Bone & Joint Surg. (no. 4) **30B**: 624, 1948.

2. Sloman, N. (1921): On Coalitio-Calcaneonavicularis, J. Orthop. Surg. **3**: 586, 1921.

3. Badgley, C. E.: Coalition of the Calcaneus and the Navicular, Arch. Surg. **14**: 75 (July) 1927.

4. (*a*) Pfitzner, W.: Beiträge zur Kenntniss des menschlichen Extremitätenskelets: VII. Die Variationen im Aufbau des Fusskelets, in Schwalbe, G.: Morphologischen Arbeiten, Jena, G. Fischer, 1896, vol. 6. (*b*) Dwight, T.: A Clinical Atlas: Variations of the Bones of the Hands and Feet, Philadelphia, J. B. Lippincott Company, 1907.

5. Lapidus, P. W.: Spastic Flat Foot, J. Bone & Joint Surg. **28**: 126, 1946.

6. Magee, R., and Benson, R.: Calcaneo-Scaphoid Bar, Canad. M. A. J. **55**: 287, 1946.

peroneal spasm to subside, after which the relative rigidity can be demonstrated. In younger children about the age of puberty the subastragalar motion may be only moderately limited. Abnormal stress on the midtarsal joint as a result of fixation of the bar brings about arthritic changes the most notable of which is an osteophytic lipping of the dorsolateral margin of the head of the astragalus. Harris and Beath state that this is invariably associated with these anomalies. While this is generally true, some of our younger cases did not show these changes while others not having congenital anomalies exhibited severe development of osteophytes. Likewise, older patients with these anomalies, but without symptoms, failed to show any evidence of tarsal arthritis. However, all the older symptomatic cases manifested this change on x-ray.

This anomaly may be unilateral or bilateral and may form a complete osseous bar uniting the calcaneus and navicular, or the bar may be incomplete with a connecting bond of fibrous tissue or cartilage (fig. 1).

CASE HISTORIES

Again, referring to Harris and Beath, these authors felt that, in contrast to the talocalcaneal bridge, the calcaneonavicular bar might be present without producing either deformity or disability. Probably the same holds true for both conditions since one of our cases of a talocalcaneal bridge had no symptoms, though in all cases there was limitation of mobility. The symptomatic types of calcaneonavicular anomaly have been grouped into syndromes. (1) Those with long-standing complaint originating in early childhood. The deformity need not necessarily be severe, but persistent pain and weakness characterize this type. The rigidity of the foot, especially forefoot, is unremitting. (2) Those without symptoms or deformity (other than some valgus position of the heel, perhaps, and some restriction of the inversion-eversion movements of the forefoot) until the patient suffers a wrenching injury to the foot. The peroneal spasm and rigidity may subside on conservative measures over a period of time, but the inversion-eversion movement of the tarsus is never of normal degree. These patients may become asymptomatic insofar as the pain and spasm are concerned but remain susceptible to exacerbation on future trauma. (3) Those in which there may be actual fracture of the bar. This is theoretically a possibility but has never been demonstrated. It might be better to classify as a third syndrome those patients who have had no known complaint in previous childhood, but who develop onset of symptoms shortly before puberty and in whom the disability persists. In general the majority of cases date onset around the age of 9 or 10 yr. Some of the syndromes and variations can best be illustrated by the following case histories.

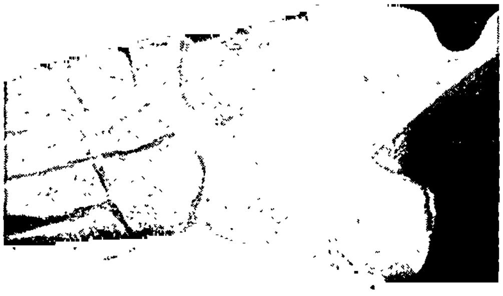

Fig. 2.—Lateral oblique view of the right foot (case 1) showing the calcaneonavicular synchondrosis. There was no arthritic change evident on lateral projection. This was an 11-yr.-old boy with similar anomalies in both feet.

Case 1.—*Bilateral Calcaneonavicular Synchondrosis.*—An 11-yr.-old white boy had foot complaints since the age of 7 yr. Because of continued stiffness and intermittent pain he was unable to run or play ball. Two weeks prior to his hospital admission he was unable to walk after a moderately long hike. Interestingly, this patient exhibited a definite varus tilt in the heels in weight-bearing, and he overran his shoes on their outer borders (fig. 3). Most of the varus tilt was on the right. Because of this he had been treated for some time with outside wedges to his shoes, but he never had complete relief from any type of support.

Physical examination revealed bilateral varus position of the heels with weight-bearing, especially on the right, and marked limitation of inversion-eversion motions of the forefoot. Repeated attempts passively to invert the foot resulted in peroneal spasm and rigidity of the foot. Passively, mobility of the os calcis was quite free bilaterally, though not of normal degree. Passive abduction of the forefoot caused pain in the region of the bar, and the patient was tender locally over that area. Roentgenograms showed a calcaneonavicular bar on the oblique view which was incomplete bilaterally (fig. 2). There was no evidence of osteoarthritic changes, and posterior oblique views revealed normal subastragalar joints.

Treatment consisted of excision of the bars. Under anesthesia relaxation of the peronei was obtained, and the feet could be inverted slightly beyond neutral position. There was, however, still marked limitation of motion. Upon direct visualization the bars were observed to possess a joint close to the base of the scaphoid. Each joint area was surrounded by a fibrous capsule, and minimal motion was noted on passive inversion-eversion movements of the feet. Midtarsal mobility was very limited. The bars differed somewhat in that the left one had a broader triangular base from the os calcis and projected anteromedially to a prominence of the lateral base of the scaphoid at an angle of about 55 degrees, while the bar on the right projected fingerlike at almost a right angle from the os calcis. Sections taken through the joint in the bar are shown in the photomicrograph (fig. 4).

Immediately after excision of the bars the feet could be passively carried through a normal range of inversion and eversion. The peroneal tendons did not cause any restriction, nor did they feel abnormally taut (fig. 3).

This case falls into the first syndrome. Resection of the bars was carried out because of the duration and severity of symptoms without evidence of arthritic changes or involvement of the subastragalar joints. In those cases with secondary osteoarthritic degeneration and restriction of subastragalar mobility a triple arthrodesis is preferable. In the five cases reported by Badgley resection of the bar was done in one and a subastragalar triple arthrodesis in another. Both operated cases had satisfactory results after a limited follow-up period. We feel that if arthritic changes are present or if there is an associated anomaly of the subastragalar joint, or both, then arthrodesis is the treatment of choice.

Case 2.—*Unilateral Calcaneonavicular Synchondrosis.*—A 14-yr.-old white boy turned his right ankle while running. Pain and stiffness of the foot persisted much longer than would be expected from a simple inversion sprain. He had had no previous complaints with his feet. Examination revealed moderate peroneal spasm with tenderness distal to the anterior talofibular ligament which corresponded to the site of the calcaneonavicular bar. There was marked limitation of lateral tarsal motion, and repetitive inversion movements of the foot threw the peronei into strong spasm so that subsequently no inversion could be performed passively. There was a good longitudinal arch to the foot, though the heel was slightly pronated. The Achilles tendon was not tight. The left foot was normal.

Conservative therapy was instituted which consisted of absolute rest from weight-bearing and whirlpool baths. The patient became asymptomatic after one month of treatment and has remained so to date, though lateral tarsal mobility of the right foot as compared with the left is limited. Roentgenograms revealed a calcaneonavicular bar on the right which was incompletely united (fig. 5). There were no other anomalies and no arthritic changes present.

This case illustrates the second syndrome which can be explained as caused by avulsion of the bar at the region of fibrous or cartilaginous union. A similar case was seen in which the patient had no complaints four years following the original acute episode. He had bilateral incomplete bars and was asymptomatic on recent examination, though his feet showed limitation of tarsal mobility. Also, there was no evidence of tarsal arthritis.

In general, feet possessing this anomaly show, with exception, some valgus position of the heel, though the longitudinal arch may or may not be depressed. There is limitation of the inversion-eversion movements of the foot. Subastragalar motion is not limited to the degree of midtarsal mobility unless there is secondary arthritic change or an additional talocalcaneal bridging. During acute episodes there is localized tenderness and pain over the region of the calcaneonavicular bar. Arthritic changes of the tarsal joints are frequently first manifested by osteoarthritic lipping of the dorsolateral margin of the head of the astragalus. This is proportionate in severity to the degree of valgus position and depression of the arch rather than to the completeness of osseous union of the bar.

THE TALOCALCANEAL BRIDGE

This tarsal anomaly consists of a bridge of bone spanning the subtalar joint and uniting the calcaneus with the talus immediately behind the sustentaculum. It may consist of a complete solid bony bridge (synostosis talocalcanea), or it may be incomplete with a fibrous bond (syndesmosis) or cartilaginous bond (synchondrosis) between the calcaneus and talus. An accessory joint may even exist. This has been attributed by Pfitzner and other anatomists to be the result of fusion of an accessory tarsal bone, the sustentaculum tali, to the astragalus and os calis. It occurs, when present, at the posterior end of the sustentaculum tali. The bridge may be united in part by cartilage and in part by bone.

In these cases there is fixation of the talus to the calcaneus, and the heel resists subastragalar motion. Osteoarthritic lipping usually is present on the dorsolateral margin of the head of the astragalus and is present more often in younger patients than in those with the calcaneonavicular bar. There is some valgus position of the heel, but the longitudinal arch may or may not be depressed. On careful clinical examination an abnormal fulness may be noted posterior and inferior to the medial malleolus at the site of this bony mass. Harris and Beath feel that this anomaly probably always causes deformity and disablement, but a patient in one of our cases had no complaints though the foot was in slight valgus position and moderately rigid. Again, complaints may arise about the age of puberty or in earlier childhood. Also, this anomaly has been found to occur in more than a single member of a family. Two cases of this anomaly studied in this series occurred in sisters, and they gave a history of an uncle who exhibited similar deformity, though he was not available for examination.[7]

CASE 3.—*Bilateral Talocalcaneal Synchondrosis.*—A 19-yr.-old white girl began to complain of her feet at about the age of 10 yr. The onset of her foot trouble accompanied minor trauma when she injured herself jumping from a height of several feet. Since then she has had increasing intermittent pain, swelling of the feet, and a tendency to "give way" in both ankles. At times the feet would become very rigid, and she could not invert them to any degree.

Physical examination revealed a good longitudinal arch bilaterally, though there was moderate pronation of the heels. Subastragalar motion was fixed, and the inversion-eversion movements of the foot were markedly limited. There was no peroneal spasm at the time of examination, though the patient stated that at times when she had pain in the feet they were held in valgus position and could not be inverted to the present degree. Most notable was a bony protuberance posterior and inferior to the medial malleolus which was due to the abnormal talocalcaneal union (fig. 6). This was not tender locally, but forceful passive joint motion caused pain in the region of the bridge.

Treatment in this case was subastragalar triple arthrodesis. The mass was excised from the medial aspect of the foot, and the synchondrosis is well demonstrated on microscopic section (fig. 8).

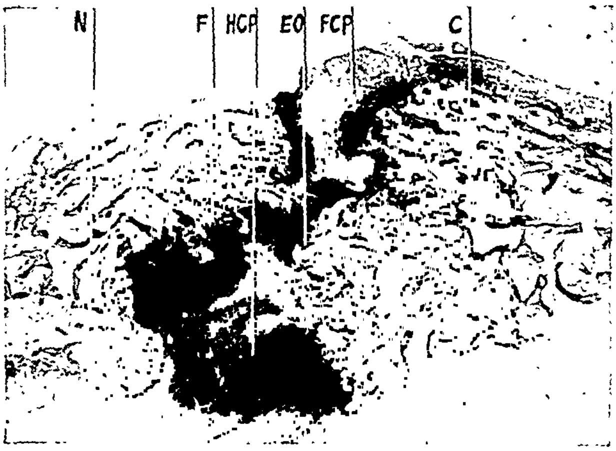

Fig. 4.—Low-power magnification of microscopic section taken through excised calcaneonavicular bar seen in roentgenogram of foot in figure 2. Two masses of essentially normal-appearing bony trabeculae; one from the anterior process of the calcaneus (*C*) and the other from the navicular (*N*) are separated by a plate of hyaline (*HCP*) and fibrocartilage (*FCP*). There is active endochondral ossification (*EO*) along the margins of the plate and areas adjacent to the cartilage in which the bone marrow is fibrotic (*F*). (Histological sections are from the Department of Pathology, Charlotte Memorial Hospital, Charlotte, N. C., by courtesy of Dr. Paul Kimmelstiel, pathologist).

In this case the anomaly could be identified on the lateral and anteroposterior roentgenograms, which ordinarily is not possible. It demonstrates very clearly the position of the talocalcaneal bar posterior to the sustentaculum tali (fig. 7). The anomaly in this case exhibited a familial tendency. The 26-yr.-old sister of this patient had an identical condition without any complaint except for an occasional "aching" in the calves (fig. 9).

With this anomaly complaint is usually of early onset, or the foot may remain entirely asymptomatic. The asymptomatic foot does not seem to possess the susceptibility to trauma that occurs in some cases of calcaneonavicular bar, and the symptomatic foot does not respond to conservative therapy as do, in certain instances, cases of other foot anomalies. Neither anomaly is peculiar to race.

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[7] These were patients of Dr. Julian Jacobs of the Miller Clinic, Charlotte, N. C. and were studied and presented with his permission.

ROENTGENOGRAPHIC FEATURES

The position of the talocalcaneal bridge posterior to the sustentaculum tali as described anatomically is well illustrated by figure 7. Sometimes the synchondrosis can be distinguished as a thin serrated line of decreased density between the bone masses. This serrated margin has also been described anatomically and may be apparent on lateral films of the foot (fig. 10). On the posterior oblique view the bone mass and line of synchondrosis are visualized inferior to the level of the normal sustentacular ledge and joint line as they lie posterior. The abnormal bone mass is of greater magnitude than the normal sustentacular process, and at times the line of synchondrosis is directed inferiorly and medially (fig. 11). There may also be a varying degree of osseous union.

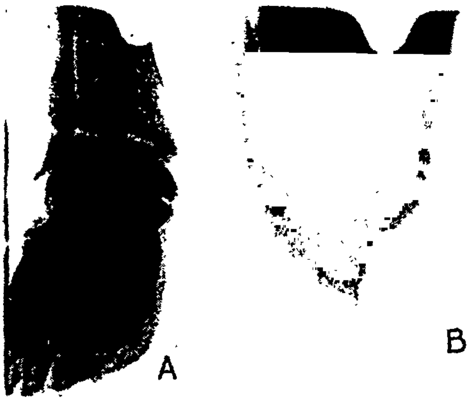

Fig. 6.—Talocalcaneal bridge of the left foot (case 3) showing the anomaly inferior to the medial malleolus on a routine anteroposterior view of the ankle (*A*). This film is reversed for better comparison with the posterior oblique view (*B*) of the same anomaly.

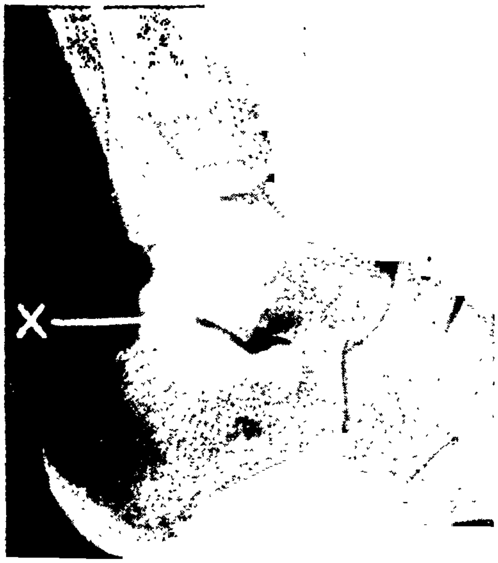

Fig. 7.—Lateral view of the foot shown in figure 6. The talocalcaneal synchondrosis can be identified as a narrow serrated line posterior to the sustentaculum tali. The anomaly cannot usually be demonstrated on a routine lateral film.

The lipping of the dorsolateral margin of the head of the talus may or may not be evident early, but it is more frequently observed in cases of talocalcaneal bridge than in cases of calcaneonavicular bar. Arthritic lipping is especially significant of tarsal anomaly when it is in combination with a good longitudinal arch and a young foot (*fig. 11*). Similar changes may occur in severe flatfeet without anomalies. In unilateral cases of these anomalies a severe flatfoot on the opposite extremity may show a greater degree of arthritic change and deformity of the arch than the side with the congenital abnormality. The symptoms are greater, however, on the side with the anomaly. The relative rigidity of the foot probably accounts for the lesser degree of tarsal arthritis in such cases. The symptoms are not proportionate to the extent of the osseous union of the anomaly. Also, tarsal arthritis in feet possessing these anomalies is not a prerequisite for complaint, yet no asymptomatic foot in our series revealed evidence of degenerative arthritis.

MICROSCOPIC FEATURES

The majority of these anomalies possess an area of synchondrosis. Microscopic studies reveal cartilaginous plate consisting of both fibrous and hyaline cartilage between the anomalous bone masses which are composed of normal trabeculated bone. The plate is of varying width and usually shows evidence of active transformation into osteoid and bony material along the margins where it is in direct continuity with the adjacent bone (fig. 4 and 8). Thus, with increased ossification with age one might expect complete obliteration of the plate of cartilage through ossification. In the series of cases presented here all those under the age of 14 exhibited a synchondrosis. The width of the plate generally was indirectly proportional to the age. This is illustrated in two of the older patients with calcaneonavicular bars. The one, 22 yr. of age, had an incompletely ossified bar (fig. 12). The other, 24 yr. of age, had a completely ossified bar (fig. 1).

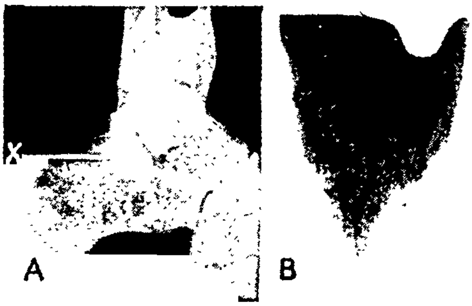

Fig. 9.—Lateral (*A*) and posterior oblique (*B*) roentgenograms of a foot of the sister of a patient in case 3 (fig. 6 and 7). This was a 26-yr.-old woman with bilateral talocalcaneal anomalies who had never had complaint with her feet, though they were relatively rigid. There is no evidence of tarsal arthritis, and, generally, the feet are almost identical to those in case 3, though there is a greater degree of osseous union of the talocalcaneal bridge.

Trauma with callus formation is a second process ossifying the plate. Injury to the plate can explain the localized complaint common with these anomalies and is, in addition to the arthritic degenerative changes, a cause of symptoms. In the cartilaginous plate areas may be found which show necrosis of cartilage and the formation of clefts (fig. 14). These degenerative changes are interpreted as the result of trauma. In young patients with a talocalcaneal bridge a mixture of chondrous and osseous union is frequently observed. This probably is due largely to callus formation (fig. 13). Such an interpretation can explain the clinical observation that this anomaly, once it has become symptomatic, does not respond to conservative therapy. The role of trauma is more prominent due to the subastragalar position of the talocalcaneal bridge.

There was no evidence of an accessory bone in any of these cases. The presence of separate bone masses is much uncommoner than these anomalies.[8] We have seen one case in addition to this group of calcaneonavicular and talocalcaneal anomalies with a separate area of ossification. This was a case in which the sustentaculum tali was partly adherent to the talus and did not restrict tarsal mobility or cause symptoms (fig. 15). Thus, the os secondarius and sustentaculum tali are probably a part of the same abnormal process since studies on the fate of other accessory tarsal bones, such as the accessory scaphoid, have shown that fusion occurs between that bone and the scaphoid in a large proportion of such cases in which a separate accessory bone was roentgenographically demonstrated.[9]

Another occasional tarsal bone, the talus accessorius, may also contribute to the formation of the talocalcaneal union. This is suggested by the position and magnitude of the anomaly as frequently encountered. In addition, the frequent occurrence of the area of synchondrosis in the inferior portion of the abnormal bone mass suggests primary osseous union with the talus.

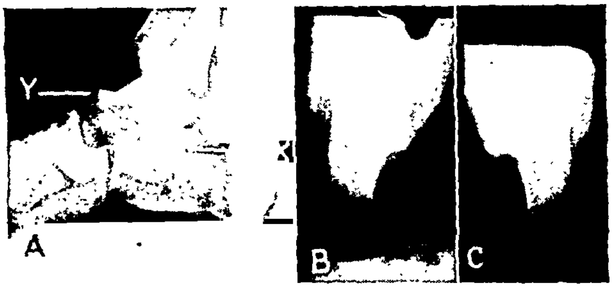

Fig. 11.—Osteoarthritic lipping of the head of the talus in the presence of a high longitudinal arch in the foot of a 13-yr.-old girl with a talocalcaneal synchrondrosis. The anomaly is not well visualized on the lateral film (*A*), though the narrow space marked by *X* between the posterior margin of the sustentaculum and the talus is suggestive. A normal talo-sustentacular joint is shown (*B*) in contrast with the anomaly as visualized from a posterior oblique view (*C*).

TREATMENT

In the treatment of spastic flatfoot the early recognition of tarsal anomaly as the etiological factor in its production is important. The plan of therapy varies somewhat depending upon the anomaly, the type of syndrome, the age of the patient, and the degree of secondary arthritic involvement.

Conservative Measures.—These are primarily reserved for cases which have only an occasional complaint following trauma and for cases of symptomatic talocalcaneal anomalies in children too young for arthrodesis of the foot. The former cases consist of those with a calcaneonavicular bar exhibiting the second type of syndrome. In these absolute rest of the foot, aided perhaps by whirlpool baths, will cause the acute symptoms of spasm and fixation to subside, but treatment is required over a moderately long period of time and normal flexibility of the foot is never obtained. Consistent support is maintained through the use of firm rubber arch pads. Plaster immobilization under anesthesia is of value since it allows maximal relaxation of the peronei and maintains support of the foot, though usually the same result may be accomplished through rest and whirlpool baths. Manipulation in itself is of no value and actually may be harmful. The rigidity resulting from the anomalies themselves after release of the peroneal spasm does not further improve under anesthesia, and forcing correction is either futile or causes additional injury to the region of congenital abnormality which was the exciting factor originally.

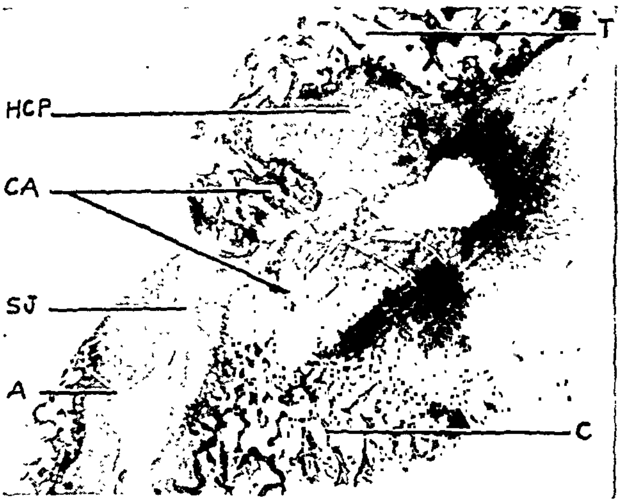

Fig. 13.—Low-power magnification of microscopic section taken through the excised talocalcaneal anomaly of the foot whose roentgenograms are reproduced in figure 10. A hyaline cartilage plate (*HCP*) separates the bone mass of the talus (*T*) from that of the calcaneus (*C*). There is an area of callus (*CA*) in which there is formation of osteoid and bony material extending across the cartilaginous plate at its medial border. This lies between the remaining lateral portion of the cartilage of the synchondrosis and the sustentacular joint (*SJ*). The defect in the articular cartilage (*A*) of the joint is the site of degenerative arthritis.

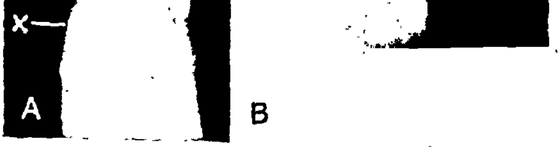

Fig. 15.—Sustentaculum tali (*A*) present in an asymptomatic foot. This was a 20-yr.-old athlete who exhibited only slight valgus position of the involved foot without any restriction of subtalar motion, arthritic changes, or previous complaint.

Surgical Measures.—(1) Calcaneonavicular bars: In young children and feet without arthritic changes the bar

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8. Burman, M. S., and Lapidus, P. W.: The Functional Disturbances Caused by the Inconstant Bones and Sesamoids of the Foot, Arch. Surg. 22:936 (June) 1931.

9. Zadek, L., and Gold, A. M.: The Accessory Tarsal Scaphoid, J. Bone & Joint Surg. 30A:957, 1948.

should be resected as early as it is recognized (fig. 16). These feet may be subject to recurrence of painful spasticity if unrecognized subastragalar changes are present, however, and a triple arthrodesis will then be required. In older cases with arthritic degeneration and rigid, deformed flatfoot, arthrodesis is the procedure of choice. (2) Talocalcaneal bridge: Arthrodesis is the treatment if symptoms warrant it and should be done as soon as osseous development of the foot permits it.

SUMMARY

The commonest cause of peroneal spastic flatfoot is tarsal anomaly consisting of a calcaneonavicular bar or a talocalcaneal bridge. Either or both anomalies may be present. Such feet exhibit some degree of rigidity even when without symptoms. However, in children during acute episodes peroneal spasm in addition is present which holds the foot in rigid fixation. Most of these feet show some degree of valgus position, though in many there may be no depression of the longitudinal arch. In the latter type foot tarsal arthritis with lipping of the dorsolateral margin of the head of the talus is significant of congenital anomaly. The presence of these abnormalities has been overlooked because of the difficulty of visualization on routine roentgenography. These anomalies usually possess an area of synchondrosis, the cartilage of which is progressively transformed into bone to varying degrees. Formation of bone through callus probably accounts for the early osseous fusion frequently found with the talocalcaneal bridge. Treatment is dependent upon the anomaly, the type of syndrome, the age of the patient, and the degree of secondary arthritic change. Early recognition of the etiology of the peroneal spastic flatfoot influences the treatment and prognosis.

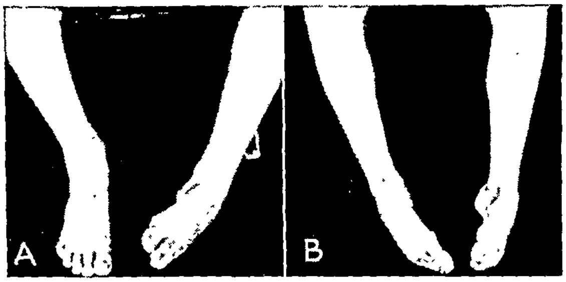

Fig. 16.—Eleven-year-old boy with a calcaneonavicular bar in the right foot who illustrates the third type of syndrome. Rigid valgus position of the right foot is shown in (*A*) before surgery. The release of tarsal rigidity is brought out by the postoperative photograph (*B*).

1108 Sharp Building (Dr. Webster).

ABSTRACT OF DISCUSSION

Dr. Earl D. McBride, Oklahoma City: Dr. Webster and Dr. Roberts have added further convincing evidence that the congenital anomalies between the calcaneus and astragalus, or calcaneus and scaphoid, may be specifically responsible for the clinical phenomenon known as spastic flatfoot. They have mentioned that these deformities have been overlooked frequently, but I would say they simply have not been looked for. Constant stressing of the necessity for oblique roentgenographic views of children's feet may eventually improve the statistics. The feet of small children seldom present symptoms of pain, no matter how pronated or flattened the arches may appear. When the child does complain of his feet or legs, and when rigidity of the tarsal joints is at all present, some of these anomalies may be responsible. Such a foot should be followed into maturity with periodic roentgenograms. Spastic flatfoot is comparatively rare. It still is not known what percentage of feet with these intertarsal anomalies do or do not develop into peroneal spastic flatfoot. So far as I can recall over a period of 30 yr. good results have been obtained from closed, forcible manipulation of the peroneal spastic flatfoot, followed by six or seven weeks of immobilization in overcorrecting weight-bearing casts. Of course, the contour of the arches, in such cases, usually remains flattened, but the ultimate result is satisfactory when adequate support and exercises are applied. Dr. Webster did not say much about treatment; however, in his paper he does recommend surgery in many of these cases and removal of the anomaly. Too much enthusiasm for surgical removal of these anomalies, based on roentgenographic discovery, might lead to inadvisable and mutilating surgery. When removal of the anomaly is necessary, as in the presence of spastic flatfoot, it would seem advisable to proceed with fusion of a type which will correct the flatfoot. I would strongly stress against surgical meddling with a child's foot through enthusiastic curiosity. I feel that we should not become too enthusiastic about surgical treatment in these cases. I do think we should become more enthusiastic about x-raying of children's feet from the standpoint of these anomalies.

Dr. Charles Young, Los Angeles: I wish to bring out some of the background of tarsal anomalies and spastic flatfoot. Previous to 1900 all cases of flatfoot were put in the broad classification of flaccid or rigid. In 1905 Sir Robert Jones described an entity which he called peroneal spasm in flatfoot. As treatment he tenotomized the peroneal tendons and manipulated the foot with a Thomas wrench until it was flexible. Plaster was applied to maintain a position of inversion and adduction. There must have been relapses because, later, he recommended the excision of a ¾ in. section from the peroneal tendons to prevent them from reuniting. We know now that muscle spasm, and not adaptive shortening, is caused by arthritic changes in the foot. A decade later Jones described another entity which he called osseous flatfoot, the foot being in a rigid deformed position but without spasm of the peroneal muscles. He was misled by the presence of osteophytes on the superior margin of the talonavicular joint. These are the result of rigidity caused by tarsal anomalies, not by true osteoarthritis. Jones did not know the etiology of this osseous flatfoot, as we have heard it described today. I am in agreement with the treatment described by the essayists. Adults with calcaneonavicular bars which are painless require no treatment. Conservative treatment can be used in painful cases, unless the pain is persistent; then surgical intervention is necessary. Patients with talocalcanean bridges have more pain, do not respond well to conservative treatment, and usually require operations. When an arthrodesis is performed on the subtalo and calcaneonavicular joints, in severe cases, it should include the calcaneocuboid joint; otherwise, correction of the deformity is difficult after division of restraining soft structures, and a good result is not so sure. When these anomalies are discovered in childhood and conservative treatment fails, operations should be postponed until the teen-ages when, as determined by roentgenograms, the tarsal bones have almost completely ossified.

Swimmer's Itch.—Swimmer's itch, or schistosome dermatitis, is a water rash found in . . . the region of the Great Lakes. It is caused by penetration into the skin of flukes known as cercariae. It does not result in disease to humans but is objectionable because of the extreme discomfort it causes. . . . The causative organisms are found living in the tissues of common snails, from which they emerge daily during warm summer weather. Bathers are infected by accidentally capturing the organisms in drops of water on the skin and allowing them to penetrate. Once inside the skin, the defensive mechanism of the body destroys them, resulting in local irritation around each point of entrance. A severe itching or burning sensation is the result. Bathers may prevent penetration of the skin by these organisms by drying the body completely and briskly with a towel immediately on leaving the water, or by taking a shower in cercaria-free water before the beach water dries on the skin.—Theodore F. Wisniewski, Aquatic Nuisance Control, *Wisconsin Medical Journal,* June, 1951.

CRYPTOCOCCUS (TORULA) MENINGITIS

REPORT OF TWO CASES

Albert W. Cook, M.D., Brooklyn

Human cryptococcosis (torulosis) was first recognized as a clinical entity in 1914 by Versé.[1] Previous reports by Busse and Buschke,[2] Gilchrist,[3] and Curtis [4] at the end of the 19th century, however, indicate that they had actually described Cryptococcus infections in man but had not classified the yeast as Cryptococcus hominis (Torula histolytica). Since that time three monographs [5] and innumerable articles have appeared in the world literature describing the characteristics of human infestations with this organism, and to date approximately 200 cases have been reported.

Although acute forms of the disease have been known, typically human Cryptococcus infections are of a chronic nature and most commonly implicate the central nervous system and lungs. Isolated instances of recovery have been cited,[6] but death is the expected termination of the disease. No specific mode of therapy is known.

In spite of an increasing number of reports of this malady, few diagnoses have been made before death and, in fact, it is still considered a rare clinical entity unfamiliar to many physicians.

The purposes of this report are several: to record two additional cases, one being recognized before death, encountered in the wards of two general hospitals in 15 months; to call attention to the various manifestations of infection in the nervous system with the Cryptococcus organism, with its problem of diagnosis; to express the view that human torulosis may not be as rare a clinical problem as has been heretofore believed; and finally, to indicate various syndromes in which Cryptococcus infections should be considered instead of assuming the existence of some other process without positive substantiation.

CASE REPORTS

CASE 1.—J. W., a woman aged 58 years, was admitted to the Brooklyn Hospital under the care of Dr. Warren Huber, with the complaint of severe headaches for the previous 39 days. These headaches had appeared three days after a smallpox vaccination and were located at the vertex of the skull. Large doses of acetylsalicylic acid afforded no relief. Three weeks prior to admission she had noted that her speech was indistinct and that she had trouble forming words. Diplopia appeared shortly thereafter, and her vision had progressively failed up to the time of admission. Members of the family had also observed that she was increasingly more somnolent and that her vision seemed to be impaired when viewing objects on the left side. Gold circles had been seen in both the right and the left visual fields.

Examination.—The blood pressure, pulse, respiration, and rectal temperature were all normal. Neurologic examination revealed the following abnormalities: (1) enlarged left pupil which reacted promptly to light directly and consensually; (2) internuclear ophthalmoplegia; (3) nuchal rigidity and bilateral Kernig's signs; (4) a left homonymous visual field defect (confrontation); (5) bilateral papilledema; (6) marked error of projection in the performance of the finger to nose test bilaterally and to a less extent in the heel to knee test; (7) absent superficial abominal reflexes, and (8) bilateral signs of Babinski. There were no changes in sensation, muscle reflexes or in the function of any of the other cranial nerves. Her speech difficulty was primarily that of an inability to form words and enunciate correctly. She was able to obey visual and auditory commands promptly and accurately and all objects and their uses were appreciated correctly.

During the course of the examination her position was changed from a supine to a sitting attitude. Upon return to the former her condition changed suddenly. Her head turned from side to side, and vertical nystagmus was detectable. The left upper extremity was thrown over her head and when she was asked to touch her nose, her hand traveled in all directions, finally landing on her face with a thump. She said "I'm so sleepy, so sleepy all the time." In several minutes these signs disappeared and she became more lucid.

No abnormalities were found after a general physical examination except a fading maculopapular rash over her neck and shoulders. There was no local reaction at the site of vaccination. Roentgenographic examinations of the skull and chest were considered negative.

In view of the history of vaccination, a diagnosis of postvaccinal meningoencephalitis was entertained although the possibility of a chronic meningitis due to an organism such as the tubercle bacillus or C. hominis was considered by her physician.

On the day following admission, paresis of the right lower face and upper extremity appeared and a lumbar puncture showed clear and colorless cerebrospinal fluid under normal pressure. In order to exclude the slight possibility of a subdural hematoma, bilateral burr holes were appropriately placed. Since there was no evidence of recent or old subdural bleeding, air was introduced into the ventricular system and subsequent ventriculograms revealed no change in the size, shape, or position of the ventricles. The only significant finding was that of a large accumulation of cerebrospinal fluid within the subarachnoid space overlying the right cerebral convexity. On subsequent lumbar punctures the spinal fluid was yellow and contained from 200 to 350 cells, the greater proportion of which were mononuclear in type. The unusual large size of these cells prompted the laboratory technician to consult the clinical pathologist, who immediately appreciated their importance and after staining demonstrated numerous yeastlike bodies with gram-positive granules of varying size. The total protein and sugar contents of the spinal fluid were estimated on various occasions at 70 to 80 and 10 to 18 mg. per 100 cc., respectively. The colloidal gold curve was normal and the cerebrospinal fluid contained 763 mg. of chlorides per 100 cc. on one occasion. Culture of this fluid yielded a luxurious growth of C. hominis. The organism was then cultured on glycerin veal and Sabouraud's medium (incubated at room temperature for 18 hours) and found to be resistant to 100 Oxford units of penicillin and 1,000 units of streptomycin.

In spite of treatment with chemotherapeutic and antibiotic agents available at that time (before aureomycin, chloramphenicol and others), little improvement was noted in the patient's clinical course. Repeated spinal punctures continued to yield a

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From the Brooklyn Hospital, and the United States Naval Hospital, St. Albans, N. Y.

The Department of Pathology, United States Naval Hospital, St. Albans, N. Y., gave permission for the use of their autopsy material, and the clinicians mentioned in the text made their case records available.

[1] Versé, M.: Über einen Fall von generalisierter Blastomykose beim Menschen, Verhandl. d. deutsch. path. Gesellsch. **17**: 275, 1914; cited by Cox and Tolhurst, and Freeman.[5]

[2] Busse, O.: Über parasitäre Zelleinschlüsse und ihre Züchtung, Zentralbl. f. Bakt. **16** (pt. 1): 175, 1894. Buschke, A.: Deutsche med. Wchnschr. 1895, W. Vereins Beilage. p. 14; cited by Benham.[7]

[3] Gilchrist, T. C.: A Case of Blastomycetic Dermatitis in Man, Johns Hopkins Hosp. Rep. **1**: 269, 1896; cited by Cox and Tolhurst.[5]

[4] Curtis, F.: Contribution a l'étude de la saccharomycose humaine, Ann. Inst. Pasteur. **10**: 449, 1896; cited by Cox and Tolhurst.[5]

[5] Cox, L. B., and Tolhurst, J. C.: Human Torulosis: A Clinical, Pathological and Microbiological Study with a Report of Thirteen Cases, Melbourne, Australia, Melbourne University Press, 1946. Stoddard, J., and Cutler, S.: Torula Infection in Man, Rockefeller Institute for Medical Research, Monograph 25, 1916, p. 1. Freeman, W.: Torula Infection of the Central Nervous System, J. f. Psychol. u. Neurol. **43**: 236, 1931.

[6] O'Neill, F. J.; Newcomb, A., and Nielsen, C. S.: Cryptococcus Meningitis, U. S. Nav. M. Bull. **49**: 300, 1949.

yellow fluid with an elevated total protein, a low sugar, and pleocytosis. She gradually lapsed into coma and died 21 days after admission to the hospital. Permission for an autopsy was not granted.

CASE 2.—E. A., a 19-year-old Negro youth, was first admitted to the hospital in June 1948, with the chief complaints of frontal headache and vomiting for the previous month. The headaches remained for a few hours and disappeared abruptly. At first there were no concomitant symptoms, but later nausea and vomiting and bilateral shoulder pain accompanied the attacks of headache. At one time numbness and tingling of the entire right upper extremity appeared but apparently remained for only a short time. Prior to the onset of these disturbances the only relevant symptom was that of staggering to both sides six months before entry into the hospital.

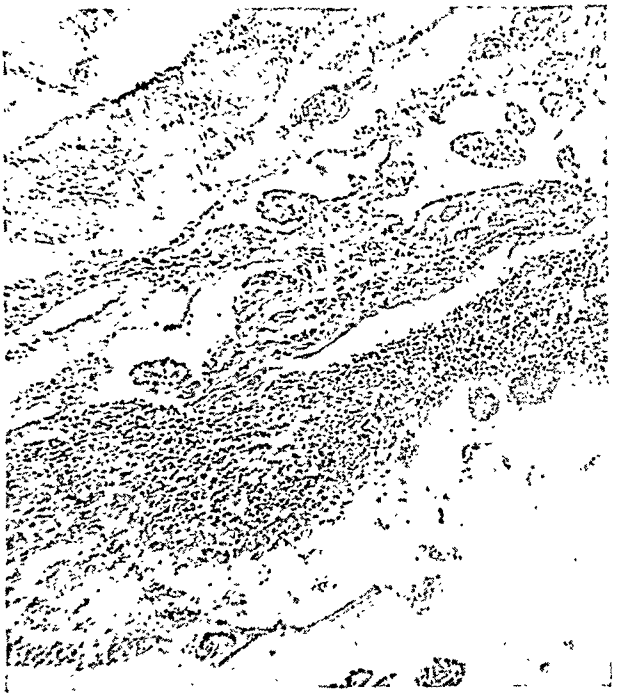

Fig. 1.—Granulomatous lesion and Cryptococcus organisms in the meninges. Hematoxylin and eosin; ×60.

Examination.—The blood pressure, pulse, respirations, and rectal temperature were all normal. The patient was poorly developed, lethargic, and despondent. The only abnormal neurologic findings were a tendency to stagger to the right when he walked with his eyes closed and bilateral papilledema of 3 to 4 D. His neck was not stiff, and hyperextension of the head on the neck did not produce additional symptoms. There was no impairment of the function of structures innervated by any of the cranial nerves other than the changes noted in the optic nerves. Visual acuity was normal on both sides, but perimetric examination of the visual fields disclosed bilateral enlargement of the blind spots and a concentric contraction of both fields. There was a female distribution of pubic hair, no axillary hair, no chest hair, and no facial hair. An electroencephalogram was interpreted as being normal.

Because of the patient's age and the symptoms and signs of increased intracranial pressure, a posterior fossa neoplasm was suspected but a subdural hematoma was also considered. Trephination of both the temporal and the occipital areas bilaterally revealed only a brain under considerable tension, without evidence of subdural hemorrhage (Dr. William Druckemiller). The posterior fossa was then explored. Here a very thick opaque arachnoid was seen over an enlarged cisterna magna. This was incised and found to be adherent to the underlying cerebellar cortex and overlying dura. The cerebellar tonsils had not herniated through the foramen magnum, and after thorough exploration nothing suggestive of a neoplastic lesion was found.

On the first postoperative day the rectal temperature was 101 F., but it returned to normal in 24 hours. The patient vomited frequently and complained of pain over the right eye. Sensation, reflexes, and motor power in all extremities remained unaltered. Lethargy persisted. On the fourth postoperative day a lumbar puncture was done and the cerebrospinal fluid was found to be grossly bloody under a pressure of 288 mm. No organisms were found in the fluid. The headache, vomiting, and lethargy continued for the next two days; then the blood pressure and pulse began to fluctuate. His respirations were interrupted by periods of apnea. Subsequent lumbar punctures alleviated these symptoms temporarily but with each succeeding day he became less responsive. On the 21st postoperative day the rectal temperature was subnormal and he was incontinent of urine and feces. From this time to his demise he was unresponsive and moist rales were heard at both lung bases on the 29th postoperative day. The latter increased markedly in the next ten days until he died, on the 39th postoperative day. The final clinical diagnosis was adhesive arachnoiditis of the posterior fossa due to an unknown cause.

Autopsy Findings.—In addition to passive congestion of the viscera the pertinent findings were confined to the brain and lungs.

Lungs: The lungs weighed 600 Gm. together. The right lower lobe was firm and nodular and the pleural surfaces were covered with a fibrinous exudate. The cut surface was marked by irregular, elevated, granular areas from which purulent material could be expressed. Microscopic examination of this tissue revealed two circumscribed areas of caseous necrosis, one with a suppurative center and surrounded by epithelioid cells and fibrous connective tissue. A few oval, semitranslucent bodies with refractile capsules suggestive of cryptococcus organisms were noted. There was a severe purulent bronchopneumonia, and acid-fast stains did not reveal any organisms suggestive of the tubercle bacillus.

Brain: The cerebral convolutions were approximately equal in size, but all the gyri were tremendously flattened, with obliteration of the sulci. The pia-arachnoid over the convex surfaces of the brain was thick and milky in appearance. There were dense adhesions between the cerebellum and the medulla, obliterating the foramens of Luschka and Magendie. Dense adhesions were found in the dura over the posterior surfaces of both lateral cerebellar lobes. On frontal section, the anterior horns of both lateral ventricles were greatly dilated, and the third ventricle moderately so. There were enormous dilatations of the posterior horns of both lateral ventricles and the aqueduct was moderately dilated. As one looked through the dilated fourth ventricle from

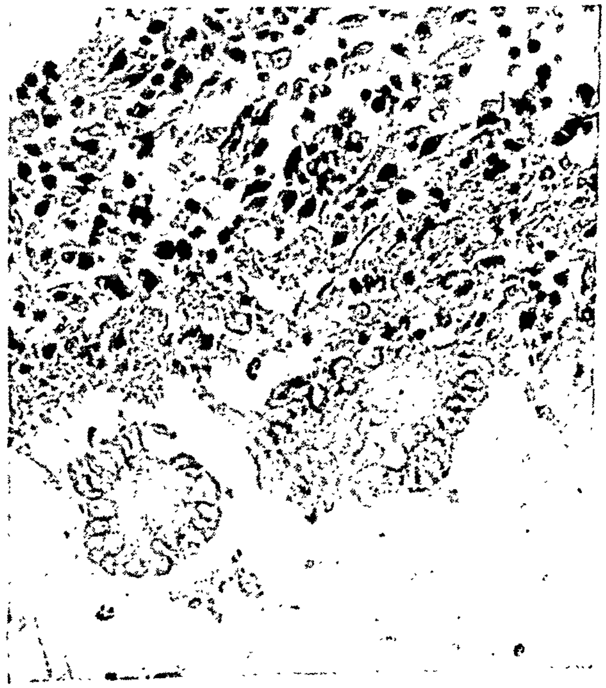

Fig. 2.—Granulomatous lesion and Cryptococcus organisms in the meninges. Hematoxylin and eosin; ×440.

anterior to posterior, the ependyma appeared granular and the foramina of Luschka were represented only by small depressions. There was no trace of the foramen of Magendie, and no communication could be found into the cisterna magnum. Microscopic examination of sections from the cerebellum and brain stem revealed an extensive and severe chronic granulomatous inflammation of the leptomeninges. The superficial layers of the brain were also involved in this process with several discrete lesions being placed at a much deeper level. The ependyma was similarly involved. The inflammatory process consisted of a poorly organized mixture of epithelioid cells, a few giant cells, plasma cells, lymphocytes, and an occasional polymorphonuclear leukocyte. Refractile spherical bodies with gelatinous capsules were found both within the giant cells and lying free in the exudate. Occasional small buds were noted on these organisms, which were very suggestive of C. hominis (figs. 1 and 2).

COMMENT

The sequence of events leading to the diagnosis of C. hominis infections in the central nervous system in these two cases is fairly representative of the experience of other authors. The clinical picture is, at first, confused with either meningoencephalitis from other causes, or subsequently, subdural hematoma and brain tumor are sought by trephination, ventriculography, and finally exploration. When, even after these procedures, the etiologic diagnosis is still not apparent, one must await the result of necropsy studies. Here, the great majority of diagnoses are made.

The crucial point in the antemortem diagnosis is, of course, the examination of the spinal fluid, and more particularly the isolation of the organism from this fluid. However, here there are many pitfalls. At times, as in the case of the first patient, the fluid may be clear and colorless when it is first examined, but most often it is yellow and has an elevated protein content. The organism, if thought of, may be easily visible and recoverable by culture,[7] yet even when visible it may be incorrectly reported as lymphocytes or red blood cells. In case 1 it was only because of the alertness of the laboratory technician in realizing that the cells he saw were unusually large that recognition by the clinical pathologist was possible. It can be readily appreciated how fortuitous this finding was, especially since an autopsy was not performed and undoubtedly the true diagnosis would never have been evident. When such cases appear in the younger age groups the common diagnosis is usually tuberculous meningitis even though an organism is never isolated. Similarly, in other cases of so-called chronic arachnoiditis, chronic serous meningitis and other vague forms of chronic meningitides, Cryptococcus infections should, at least, be considered. It is indeed significant that in the second patient the diagnosis was not evident until microscopic examination of the brain. In the past it was merely of academic interest to make such a differentiation, but with the ever-increasing availability of newer chemotherapeutic and antibiotic agents, it is incumbent upon the physician to attempt to substantiate his diagnoses in these cases from an etiologic standpoint so that a true evaluation of these new drugs can be made in diseases which are otherwise almost universally fatal.

SUMMARY

Two cases of Cryptococcus (Torula) meningitis are reported, one being recognized antemortem. The various manifestations and problems of diagnosis are mentioned and illustrated by the case reports. The view is expressed that human Cryptococcus infection of the central nervous system may not be as rare as is believed. Only future investigators will establish the value of searching for this organism in otherwise vague unsubstantiated chronic meningitides when the ever-increasing number of chemotherapeutic and antibiotic agents are used to combat it.

806 Carroll Street.

[7] Benham, R. W.: The Fungi of Blastomycosis and Coccidioidal Granuloma, Arch. Dermat. & Syph. 30:385 (Sept.) 1934.

TREATMENT OF ACNE VULGARIS

George C. Andrews, M.D., Anthony N. Domonkos, M.D.
and
Charles F. Post, M.D., New York

Stuart Way and one of us (G. C. A.) recently reviewed the literature of acne vulgaris with especial reference to hormone imbalance.[1] The present paper simply describes an experiment. Two years ago we decided to try to use for a year only antibiotics and estrogenic substances in treatment of acne vulgaris and not to employ X-ray irradiation.

We had up to that time achieved some good results with antibiotics, estrogenic substances, and other modern medicines. This small success made us wonder whether modern medical progress had reached a point where acne could be cured by these remedies. Our success during this first year of the experiment was so satisfactory to all that we have continued the experiment through the second year without any misgivings as to its superiority over the older methods of treatment in vogue five or 10 yr. ago.

Whereas prior to the beginning of this experiment X-ray treatment was routinely used in practically all cases of acne and was considered essential, it was suddenly discovered that without X-ray treatment just as good, if not better, results were achieved. Indeed our most interesting cases were those in which the patients had received long series of X-ray treatments before coming into our hands. It was in those cases of the nodular and cystic type that had not responded to X-ray treatment that our most gratifying results were achieved.

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This paper is the first in a "Symposium on Therapy," read before the Section on Dermatology and Syphilology at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 30, 1950.

[1] Way, S. C., and Andrews, G. C.: Hormones and Acne: Clinical Evaluation of Hormonal Therapy in Adolescent Girls with Acne, Arch. Dermat. & Syph. 61:575-588 (April) 1950.

The experiment was based upon certain concepts of fundamental importance. These concepts may differ from those generally held; they would not be worth reporting unless they did. We have, however, come to rely upon them as a result of our studies and experiences.

1. We assume that simple cases of oily seborrhea, comedones and papular acne (acne simplex) can be cured by a low-fat diet, the administration of vitamin A and diethylstilbestrol, the expression of comedones, and the use of orthodox local remedies such as lotio alba, sulfurated lime (Vleminckx's) solution, and remedies for the scalp.

2. Another assumption is that in pustular, nodular, and cystic cases the patients usually are sensitized to the Staphylococcus. They often harbor foci of infection which contribute to the pustulation and make it worse, if not being the sole cause. This view was expressed 20 yr. ago by one of us (G. C. A.) in the first edition of his textbook, and he was then reprimanded about this statement in the review of the book in the *Archives of Dermatology*. However, time has passed, and over and over again in these 20 yr. this concept has been borne out in practice. For example, one girl with pustular acne had pyelonephritis, and whenever the acne was bad the urine contained pus: As soon as urinary antiseptics cleared the urinary tract of infection, the acne disappeared. In another girl the acne was associated with chronic sinusitis, and the use of sulfathiazole nose drops and irrigation of the sinuses promptly cleared the acne. Several cases were promptly and spectacularly cured on the removal of impacted and infected wisdom teeth or badly infected tonsils, or after appendectomy. Sometimes we have failed to find foci of infection in pustular cases of acne, but often foci are present.

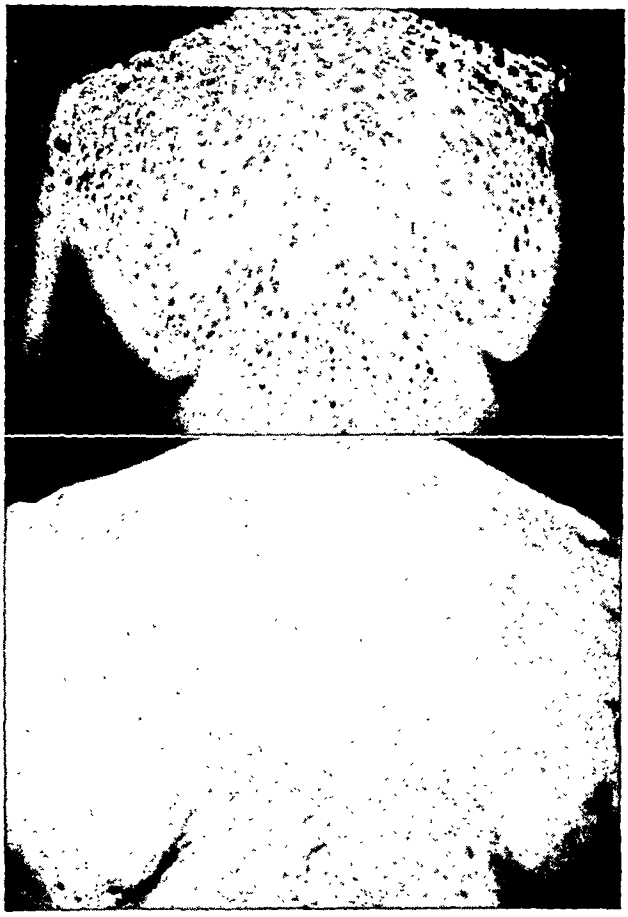

Fig. 1.—The patient, a boy aged 14, had severe, painful cystic acne of the back and the chest of one year's duration. Previous treatment had been with X rays and a low-fat diet. The patient was tired all the time and had an elevation of temperature to 100 to 101 F. each night. For two months he had had a leukocyte count of 18,000 to 22,000. Urinalysis revealed a trace of albumin and an occasional granular cast. He was treated with sulfonamides and penicillin injections with little results but cured by treatment with aureomycin, 2 gm. daily, which he took for four months, and diethylstilbestrol, 0.25 mg. daily, which he took for six months. Cultures grew hemolytic Staphylococcus aureus that was resistant to penicillin and sulfonamides but sensitive to aureomycin. Very little local treatment was given because of the extreme painfulness of the lesions.

Hormone therapy in pustular, cystic, and nodular cases has regularly been prescribed and sometimes is helpful, but on the whole the chief treatment is by administration of terramycin, aureomycin, chloramphenicol (chloromycetin®), or sulfonamides and removal of focal infection.

The importance of sensitization to staphylococci in acne seems corroborated by the recent paper of Hopkins, Weld, and Huber,[2] who by intradermal injections of staphylococci into sensitized rabbits induced histopathologic changes that showed a striking resemblance to cystic acne in the humans. Large purulent cysts, small horn cysts, and comedo-like plugs in hypertrophied hair follicles were seen. There were also acanthosis and hyperkeratosis of the epidermis and downgrowth of the hair follicles.

3. We assume also that the staphylococci in pustular cases of acne differ greatly in their susceptibility to the various antibiotics. This has been repeatedly shown by testing our cultures to penicillin, sulfonamides, streptomycin, and aureomycin as well as by clinical experience. As a rule, penicillin has relatively little clinical effect and the cocci in cultures usually show resistance to it. Sulfadiazine, aureomycin, and terramycin have given us, on the whole, the best results. We have used sulfadiazine in hundreds of cases and terramycin in only about a dozen. There have been a few exceptional cases that failed to respond to any remedy except aureomycin, or sulfapyridine, or dihydrostreptomycin, or terramycin. Very careful cultural studies of such cases failed to demonstrate any Actinomycetes or organisms other than staphylococci.

The deeply nodular and the cystic types of cases were at one time thought to be largely foreign-body reactions about inspissated comedones, but the response of these cases to treatment with the antibiotics pretty well establishes that these nodular and cystic types are due to low-grade infection. Cultures usually grow staphylococci. There is sometimes leukocytosis in such cases that persists until the skin disease is cured. Take, for instance, the following unusual cases:

Case 1.—J. A., 14 yr. of age, consulted us in December, 1948, because of blackheads, tender nodules, and crusted cystic lesions on the face, back, and chest. A complete physical examination by his family physician showed only hyaline and granular casts and pus cells in the urine. Our examination showed, besides the severe cystic acne, a leukocyte count of 24,000 with 75% polymorphonuclear cells, 22% lymphocytes, and 3% eosinophils.

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[2] Hopkins, J. G.; Weld, J. T., and Huber, W. M.: Intradermal Injection of Staphylococci, J. Invest. Dermat., to be published.

The patient's mother was instructed to take his temperature, and it was found to be elevated each evening. The erythrocyte sedimentation rate was normal. The patient was given daily injections of penicillin, 600,000 units intramuscularly, and aureomycin capsules, 500 mg. four times daily. Sulfonamides were avoided. Improvement occurred but was slow. The urinary findings persisted, as did the leukocytosis and the evening rise of temperature. Cultures from the lesions grew only Staphylococcus aureus. When this organism was tested it was found to be resistant to penicillin and very sensitive to aureomycin. The patient was thereafter treated only with aureomycin and acne capsules, the administration of both of which was continued for eight months, although the acne was cleared and the blood count and urine had become normal within five months. He had never received much local treatment because he had refused to let anyone get near his back on account of the pain he suffered from the raw and undermined crusted cystic lesions.

Case 2.—D. M., aged 14, consulted us in February, 1950, because of severe cystic acne of six months' duration. He had lost 17 lb. (7.7 kg.) since the onset. He was unable to sleep because of the very painful lesions and could not eat since movement of the jaws was extremely painful. He had avoided milk, chocolate, and fatty foods. He had received 20 X-ray treatments by another dermatologist before consulting us. Examination revealed large, crusted cystic lesions on the face, chest, and back. Many large comedones were present. Some of the cysts were blood-tinged. There was a leukocyte count of 15,500 one day and one of 19,500 a week later. Urinalysis showed a faint trace of albumin and very few granular casts. The patient was started on treatment with sulfadiazine, 2 gm., and diethylstilbestrol, 0.25 mg., daily, and the improvement was steady, but after six weeks the medication was changed to the administration of terramycin, 1 gm. daily, which cured him. The diethylstilbestrol therapy was continued. The patient refused much local treatment because of the painfulness of the lesions.

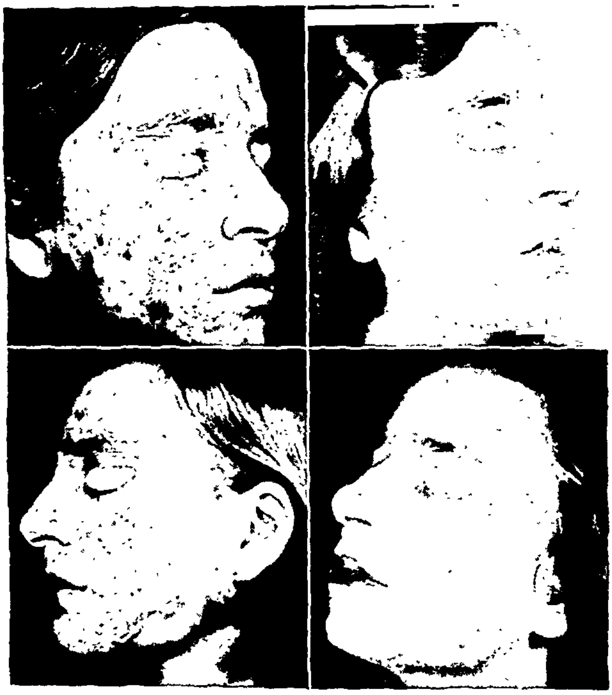

Fig. 2.—The patient, aged 14, had had cystic acne for three years. She had received X-ray treatment, penicillin injections, and a low-fat diet without benefit. Cure was effected by the administration of sulfadiazine internally for four months, tonsillectomy, and the administration of diethylstilbestrol, 0.5 mg. daily. Blood count showed 12,500 leukocytes, 3,900,000 erythrocytes, and 79% hemoglobin at the beginning of treatment. In addition, the patient was given lextron® capsules (a proprietary liver-stomach concentrate with iron and vitamin B complex) and weekly intramuscular injections of estradiol benzoate (progynon® B), 2,000 to 6,000 units, for three months.

FEMALE SEX HORMONE

Female sex hormone has been administered in three ways. First, diethylstilbestrol has been prescribed in an enteric-coated tablet (Eli Lilly & Co., Indianapolis) in a single dose of 0.25 mg. daily. Rarely, the dose was changed to 0.1 or 0.5 mg. On other occasions we have prescribed gelatin acne capsules, each having the following formula:

Diethylstilbestrol	0.00025 gm.
Powdered extract of cascara sagrada.	0.01600 gm.
Desiccated thyroid..............	0.00800 gm.
Sodium bicarbonate, as much as desired	

The patients, male or female, take one at bedtime. Rarely, girls have been given two and three daily. In some recalcitrant cases additional doses of estradiol benzoate, consisting of 2,000 and 6,000 rat units weekly, have been given parenterally.

Fig. 3.—The patient, aged 16, had had pustular acne of the face and the back for two years, during which he was treated by a local dermatologist. He was cured by the administration of sulfapyridine, 2 gm. daily for three months, and diethylstilbestrol, 0.25 mg. daily for nine months. He used lotio alba locally. He had been drinking 3 qt. (2.83 l.) of milk a day; this amount was reduced to a glass a day.

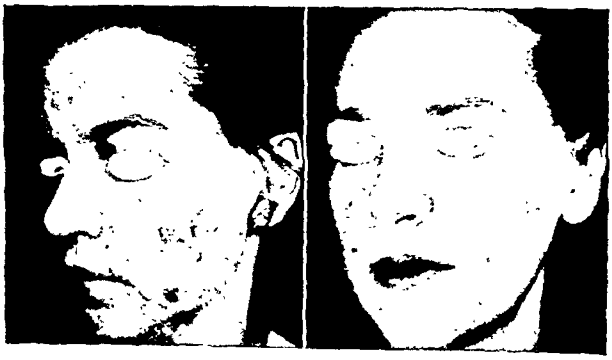

Fig. 4.—The patient, aged 31, had had acne for six years and had received the limit of X-ray treatment and a low-fat diet. The condition was cured by the administration of diethylstilbestrol, 0.5 mg. daily, and sulfapyridine, 2 gm. daily for four months, supplemented by occasional injections of crude liver extract and estradiol benzoate.

In most instances the estrogenic hormone was given throughout the menstrual cycle. In those cases in which previously regular menses became irregular it was necessary to adjust the dose around the time of the menstrual period. This was accomplished in two ways. First, a large parenteral dose of estradiol benzoate (10,000 rat units) was given just before the expected time of the menstrual period, or a dose of 20-25 mg. of progesterone was given in anticipation of menstruation, treatment then ceasing for a time. Apparently after a high level of either estrogen or progesterone has been built up, the ensuing precipitous fall in hormone level accompanying the cessation of treatment with the substance brings about menstruation. The appearance of menstruation is more consistent following progesterone withdrawal. This observation bears out the statement of Grollman [3] that, physiologically, menstruation results from regression of the corpus luteum and a fall in progesterone level in the organism. More recently these schedules have been combined in the giving of estrogen for 16 to 18 days following menstruation, then the substitution of an oral progesterone preparation for five days, and then the withholding of all hormone therapy until menstruation occurs.

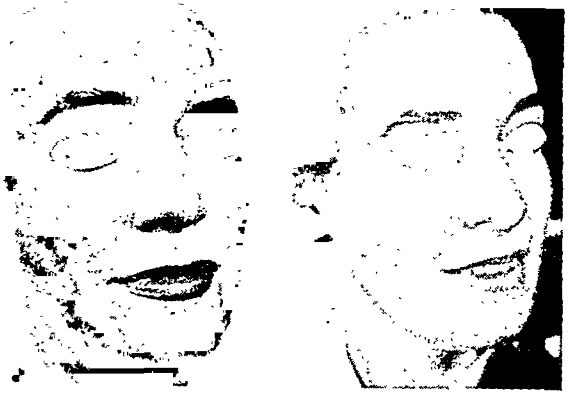

Fig. 5.—Nodular cystic acne in the 30-yr.-old patient was of 15 years' duration. There had been X-ray treatment and dietary restriction. The condition was made worse by the administration of any form of sex hormone and was recalcitrant to sulfonamide, penicillin, and aureomycin therapy, but was cured beautifully and promptly by the administration of terramycin, 2 gm. daily for one month, followed by the use of 250 mg. daily for two months.

Under such a regimen the menstrual periods are usually prompt, occurring 28 to 30 days apart. Similar regulation can be obtained by the administration of estrogen merely during the first two weeks following menstruation, but this method has a drawback in that with it hormone therapy is only at work half the time.

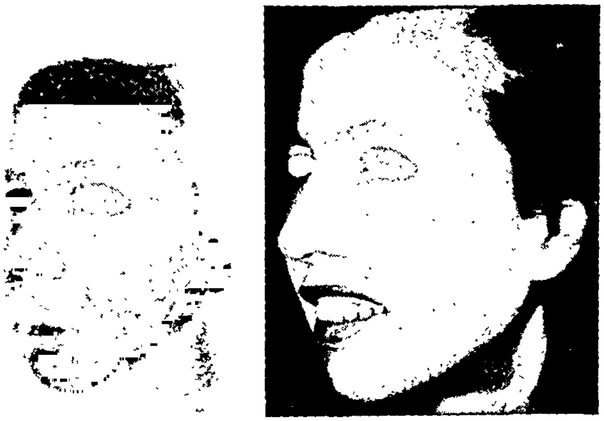

Fig. 6.—The patient, aged 19, had had pustular acne for six years. Previous treatment had been with X rays and diet. The tonsils had been removed. There were unerupted, impacted, infected wisdom teeth. Hemoglobin was 68%. The condition was cured by the administration of sulfadiazine, 2 gm., and diethylstilbestrol, 0.25 mg. daily, and the extraction of the third molars. The patient took sulfadiazine for three months.

With regard to possible untoward effects of female-sex-hormone administration, we should like to quote Wright,[4] who says,

> A dose of 0.25 mg. stilbestrol daily is a minimal one and is right on the threshold of producing possible definite therapeutic effects from the endocrine standpoint.
>
> With respect to the girls, there is probably less likelihood of any possible harm than in the boys. There may be some increase in mammary development and precocious menstruation. This would be difficult to differentiate from that which would normally be taking place in the female at this age. If the therapy is long continued, there might be some interference with normal progression of adolescence.
>
> With respect to the boys, there may be some delay in puberty in a few cases caused by this minimal dose. I would watch particularly for sensitivity to stilbestrol, as evidenced by mammary development in these boys. There may be some depression of testicular function (which would account for the delay in puberty); this would be evidenced by oligospermia but clinically would be rather difficult to determine, since a normal sperm count has never been obtained in these boys.

Wright goes on to say that this form of therapy should not be continued any longer than necessary to control the acne, that total stoppages of diethylstilbestrol therapy at intervals would help prevent untoward effects, and that there is little likelihood of producing permanent definite harm from a dose of 0.25 mg. daily. This statement represents a considered opinion and is a composite view held by several outstanding pediatricians and endocrinologists.

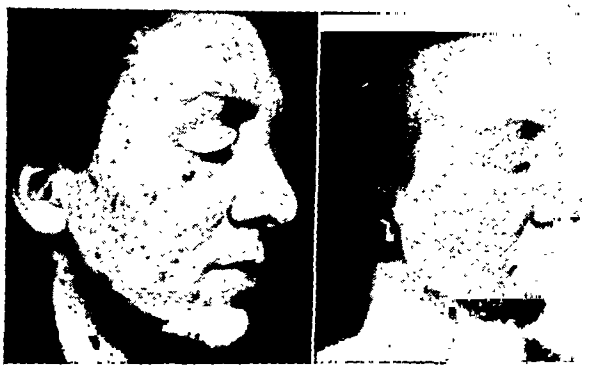

Fig. 7.—The patient, aged 21, had had nodular cystic acne of the face and the back for eight years. She had had 16 X-ray treatments and a low-fat diet. She had two dead teeth. Her acne was worse at menstrual periods, of regular occurrence. The condition was cured by the administration of sulfadiazine, 2 gm., and diethylstilbestrol, 0.25 mg. daily, and the extraction of abscessed teeth. The patient also received crude liver extract, 2 cc. intramuscularly, each week, and occasional injections, 2,000 units, of estradiol benzoate. She took sulfadiazine for six months.

Menstrual disturbances occurred in 65 (25%) of the 262 female patients. This was manifested by delayed menstruation, which was readily corrected by the methods previously noted. In the female patients there was one case of unilateral enlargement of the breasts, which disappeared within two weeks after cessation of therapy. In the 79 male patients there were six cases in which there occurred temporary tenderness or enlargement of the breasts, which was usually not noticed by the patient until it was brought to his attention. One patient took 0.5 mg. of diethylstilbestrol daily from June to October, 1949. His wife recently had a 9 lb. (4,082 gm.) baby boy. Some of the young men who had severe oiliness and acne, so that their appearance was repugnant, took this dose of diethylstilbestrol for two years with nothing but apparent good effects on their growth, on their development, and on their skin. However, to be extra-cautious, we usually try to have rest intervals for the male patients, even if clinically such rest intervals seem unnecessary. In severe nodular, pustular, and cystic types of acne we have not increased the doses of estrogens but have depended largely on the administration of antibiotics. In two cases of the cystic type, any kind of hormonal therapy, even minute doses, made the patients worse. These two patients were cured by use of terramycin.

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[3] Grollman, A.: Essentials of Endocrinology, ed. 2, Philadelphia, J. B. Lippincott Company, 1947.

[4] Wright, A. (Schering Corporation, Bloomfield, N. J.): Personal communication to the authors.

We gave 341 patients (88%) some form of estrogenic therapy. A group of 154 patients received treatment by estrogens for three months or less, 66 for four to six months, 78 for six to 12 mo. and 42 for 13 to 24 mo. Of these, there were 79 (23%) male patients and 262 (77%) female patients, a ratio of 1:3.4.

SULFONAMIDES AND ANTIBIOTICS

Patients having a very pustular eruption require, in addition to the administration of hormones, a course of sulfonamide or antibiotic therapy. It is important to prevent pustules because scars are mostly caused by pustules. Sulfadiazine is usually given in doses of 2.0 gm. daily for about two weeks, and then the dose is reduced to 1.0 or 1.5 gm. daily for eight or 10 more weeks. Although most pustular eruptions respond to this treatment, some cystic cases do better with sulfapyridine therapy. Blood counts and urinalysis are done frequently while sulfonamides are given. In a few cases of cystic acne aureomycin, terramycin, and dihydrostreptomycin have proved curative when the sulfonamides have failed. Aureomycin and terramycin were given in doses of 1 gm. daily for several months. The use of terramycin has been especially beneficial and well-tolerated. As its cost is reduced, it may become an increasingly valuable remedy in severe pustular types of acne.

It has been brought out in this series of cases that cures of many severe nodular and cystic cases of acne can be accomplished by the use of sulfadiazine, sulfapyridine, aureomycin, or terramycin without any other remedy. This fact alone suggests, first, that we must revise some of the long-held theories about acne, and, second, that infection by staphylococci is the chief cause in some cases.

FOCAL INFECTION

Frequently occurring at an age when acne appears are focal infections in impacted and unerupted wisdom teeth and in tonsils. Especially in patients 19 yr. of age or over, the wisdom teeth should be carefully X-rayed and examined. In older patients, nonvital teeth should be held under suspicion. Rarely other foci, as have been mentioned, are of importance. Many cures of long-standing acne in this series can be attributed to careful search for and removal of foci of infection. Of the 384 patients in the present series, a foci of infection was found in 45 (11%). Of these, the teeth were involved in 29 (64%), the tonsils in 13 (28%), and the sinuses in three (8%) of the cases.

SYSTEMIC MEASURES

Always a complete blood count was done and deficiencies in erythrocytes or hemoglobin were appropriately treated, or leukocytosis suggested further studies for foci of infection or treatment by antibiotics.

The chief features of the diet recommended are the avoidance of excessive amounts of fatty and fried foods and sweets and the eating of plenty of fruit, cereal, meat, and vegetables. Chocolate, nuts, ice cream, cream, egg yolk, and cheese should be avoided. Milk should be limited to a glass or two a day. Diet plays a negligible role in pustular and cystic cases. Where the patient is underweight, has poor posture, pallor, and listlessness, injections of crude-liver extract or vitamin B_{12} are given. These are also useful if there is much seborrheic dermatitis concomitant with the acne. Hypochromic anemia is treated by administration of ferrous sulfate. Arsenic in the form of potassium arsenite (Fowler's) solution was sometimes prescribed. Basal metabolic rates and serum cholesterol levels were determined for many patients, and thyroid extract was given whenever indicated. Staphylococcus ambotoxoid injections were occasionally given in a series of 10 or more injections. In the presence of many comedones, vitamin A is given. The dose ranges from 100,000 to 200,000 units a day, and this dose must be continued for three to six months before its effectiveness may be judged. In addition, aqueous dispersions of vitamin A may be given once or twice weekly parenterally in severe cases of comedones. Such large doses may be continued for months without harm, but prudence suggests that reductions in the dose should be made after a year.

Emotional factors are extremely important in acne. The psychosomatic relationship is unquestionably present, and after the emotional conflicts and problems are rationalized the acne subsides. Observation of the close relation of acne to puberty and sex hormones and the effects of these forces upon the emotions clarifies to an extent the psychosomatic features of acne. We have thought that we noted improvement of the psyche along with improvement of the skin. Perhaps some severe cases of acne are caused by overactivity of the androgens, which overactivity at the same time produces perplexing problems and emotional conflicts for the boy or girl. At any rate, there is no doubt that as the acne subsides from the use of diethylstilbestrol and other remedies the patient becomes happier, more contented and less detached from society.

LOCAL TREATMENT

Local treatment is of great importance. Supplementary cleansing of the skin with alcohol in addition to the use of soap and water morning, noon, and night will decrease the number of comedones and the amount of infection. As a more-or-less routine procedure, we prescribe the application of hot sulfurated lime solution compresses twice weekly and lotio alba or some other sulfur preparation, sometimes containing resorcinol, at bedtime. Occasionally a suspension of ammoniated mercury (alulotion,[5] ammoniated mercury with kaolin, Wyeth, a lotion containing ammoniated mercury, 5%, with kaolin and aluminum hydroxide gel) is used. The application of topical preparations of tyrothricin, bacitracin, and aureomycin is sometimes beneficial. Comedones are extracted and pustules are drained at weekly office visits. Patients are weighed every three weeks. Instructions are given for the patient to wash the face with soap and water at least twice a day and to avoid creams and greasy preparations. Nongreasy cosmetics are permitted but must be applied with clean cotton because reinfection may occur from dirty powder puffs. When peeling of scars is desired, ultraviolet or cold quartz light irradiation or applications of carbon dioxide slush are given, or scarification is done with a No. 11 Bard-Parker knife.

Concomitant seborrhea of the scalp is treated with appropriate local remedies.

CONTROL SERIES

As a control, 1,287 records of cases of acne treated by X rays prior to 1948 were reviewed, and selection was made of 253 of these records which met the following criteria:

1. All patients had been treated with X rays in a period before our newer methods were instituted and had not received estrogenic hormone, chemotherapeutic, or antibiotic therapy. Cases were not included if the patients had received X-ray treatment elsewhere, and a therapeutic total dose must have been given under our supervision. No patient in this series received less than 600 r to the sides of the face, and none received more than 1,400 r to the sides of the face. In some instances, smaller doses were given to the chin or midface in addition to treatment to the sides of the face, a technic no longer used. The average total dose to the sides of the face was 1,050 r. These doses would not now be considered conservative.
2. Each case must have been followed for at least one year after treatment was begun, but in most instances the follow-up period was longer than one year and, in many cases, over five years. The average period of observation for the 253 patients was 35.8 mo., almost three years.

In this control series there were 73 male patients (29%) and 180 female patients (69%), for a ratio of 1:2.46. The average age was 20.17 yr.; the mean was 19.

The results show that 152 patients (60%) were entirely cleared up or improved; 51 patients (20%) were not appreciably better or worse, and another 50 patients (20%) cleared up for a time and then had recurrences. No consistent cause for the recurrences, such as age, sex, or amount of X-ray treatment given, can be discovered in our results. In retrospect, it seems probable that many failures and recurrences were caused by foci of infection in the teeth or tonsils which were given less consideration then than at present or by a continuation of a hormone imbalance in spite of diminished oil-gland secretion brought about by X-ray treatment.

These results are similar to those reported previously by other observers, and discrepancies can probably be accounted for by the mode of selection and the length of the follow-up period.

While it is true that some patients were cured during the first few months of treatment and their cases are not included in the results because they were not observed for a year, these cases are probably balanced off by an almost equal number in which the patients had recurrences during the first year but did not return for further treatment.

RESULTS OF TREATMENT IN PRESENT SERIES

Any critical appraisal of newer methods depended upon discontinuation of routine X-ray treatment. Moreover, an ideal control situation presented itself in those cases in which the safe limits of X-ray therapy had been administered previously. Of the 384 patients in this series, 175 (46%) had received previous X-ray treatment, mostly from other dermatologists.

The final results of treatment in the present series of 384 patients are as follows: 90 patients (23%) were cured; 276 (71%) were improved, and 18 (6%) were unimproved or worse. In other words, 94% were either entirely cleared up or improved. The time of observation has been too short for the number of recurrences to be estimated.

It can be readily seen that these results are superior to those obtained in the control series treated with X rays but without antibiotics and estrogens.

COMMENTS

Statistics in such matters are open to so much personal influence and to so many errors in judgment that probably not too much dependence should be placed on these. However, we who have done this work can assure you that the results have pleased us to a degree beyond expectation. It would be regrettable if estrogenic-hormone therapy were widely used as the sole treatment of acne. A few years ago the view was widely held that acne should be treated solely by X rays without even the expression of any comedones. Both of these views show complete ignorance. Acne is a complicated disease with important medical as well as cutaneous features. Many internal, as well as local, procedures of treatment must be carefully employed in order for one to treat acne efficiently. X-ray treatment in small doses has a permanent place in the treatment of acne. Our experiment is over, and we may use X-ray therapy again occasionally. However, the overwhelming success we have had with modern remedies has dulled our desire to use X rays and has whetted our interest in the modern therapeutic approach to acne.

115 E. 61st St. (21).

ABSTRACT OF DISCUSSION

Dr. Merlin T. Maynard, San Jose, Calif.: In 1933 I largely abandoned the use of X rays in the treatment of acne, and now, 17 yr. later, I have no regrets. Acne responds to certain influences, all of which in a measure tend to do the same thing—that is, influence the amount of ionized calcium in the skin. They are the use of estrogenic hormone substances, calcium injections, the injection of anterior-pituitary substance, ultraviolet irradiation, X-ray treatment, the giving of calciferol or irradiated ergosterol in the presence of a source of calcium. Conversely, acne flares in the premenstrual phase in women when the calcium blood level falls. It gets worse in fevers and wasting illness, when calcium is, likewise, lost. It begins in adolescence, when the demands for calcium by the growing body are greatest. My approach for many years has been through calciferol as a mainstay of treatment. Successful acne treatment swings on a common hinge. Calciferol, synthetic oleovitamin D, and the estrogenic hormones are all steroids. I approve the use of estrogenic hormones in young girls but am inclined to withhold judgment on their use for boys on the ground that the production of feminizing changes, when such boys are most sensitive to their masculinity, is psychologically dangerous. I also question the advisability of delaying puberty. Diet is moderately important, and I agree with the authors, permitting more milk than they do. I insist that gum chewing must be avoided because of the stimulation of the circumoral sebaceous glands and because of the continued movement of the inflamed areas. For local treatment I prefer soluthricin® solution (a solubilized form of tyrothricin, 0.5 mg. per cubic centimeter) in the superficial pustular cases and a solution of the intraderm® type for the usual run of the comedo and deeper forms of the disease. Vitamin A has been disappointing, as I cannot improve on the results in my original series, in which only 50% of my patients showed improvement with the use of this substance. I do not incise pustules, as I find this procedure increases scarring. I prefer to aspirate large lesions with a syringe and needle instead. There is no substitute for the "clinical sense" of the skilful and experienced practitioner in whose hands a treatment is successful that does not prove to be so in the hands of his fellows. We see the failures and not the cures and unfortunately weigh the value of a new regimen of case management on the basis of what is often the minor factor. I feel that all of us will attack the acne problem with new vigor after hearing this stimulating paper.

Dr. William H. Goeckerman, Los Angeles: The authors have made a great contribution to the management of some of these severe cases of acne. The cases presented here probably had a secondary pyogenic infection; the multiple attack is sufficient evidence of that. I wondered whether the authors had any evidence as to what part the estrogens played in the results they obtained. I have been interested in hormone therapy of acne as long as I can remember. My investigative work with estrogens has been restricted to the female. Today I unhesitatingly give the patient with acne a good prognosis, no matter what treatment has been given. I am talking about the patients I have investigated, not so much the type presented here. If my experience can be a guide, in about 30 to 40% of the cases one can obtain a good response by giving the ordinary doses of various types of estrogen. I have used possibly a half-dozen different types while trying to evaluate them. But there comes a time when the acne may grow somewhat worse or makes no progress toward cure, and that is the time when considerable critical judgment must be used. Shall the dose be increased? With perseverance and cooperation of the patients I have had good results in 90 to 95% of my cases. Why is it that certain dosages will produce a good response in some cases and then the benefit will stop, with no further result unless there is modification of approach? There is much clinical and experimental work to support a certain concept with regard to the therapeutic administration of hormones. All hormones probably have an indirect effect, and I think that statement is true of pituitary adrenocorticotropic hormone and cortisone, as well as the estrogens. They work on certain target organs. One can easily overstimulate, as well as understimulate, these target organs. I think hormone therapy is a potent agent in our hands. It can easily be abused. One can, in a certain percentage of situations, give the standard dose as it is usually given, but he cannot say, "This is the dose indicated," because one has strictly to individualize his patients; from this interest in the individual patient one will get excellent results.

Dr. George Kulchar, San Francisco: My only point in rising to speak is to ask questions. Has there been any effect through the use of estrogens in alcoholic solution on the treatment of acne, both on the scalp (acne miliaria type) and on the skin (acne vulgaris)? I have used this preparation and have been impressed with the results, particularly with acne miliaria on the scalp in seborrheic persons. The British are ahead of us to a certain extent in the treatment of seborrheic dermatitis, which is a part of acne, particularly in their use of the estrogens in the treatment of premenopausal women, women 38 and 40, with seborrheic dermatitis, which in this age group is quite refractory to treatment. I wish to ask Dr. Andrews regarding the use of combinations of Staphylococcus antitoxin and vaccine or autogenous vaccines and Staphylococcus vaccines as an adjunct in the treatment of acne.

Dr. George C. Andrews, New York: Of course, the estrogenic hormone increases calcium metabolism, and that fact may be one of the reasons its use is so effective in acne. In regard to Dr. Goeckerman's question, we have used estrogenic hormones in practically all these cases, but we find that, in the nodular cases—and in the pustular cases—we need something in addition to estrogenic hormones. Hormones are not usually sufficient in themselves. They do a great deal of good usually, but, in addition, one has to get after the pustular element, get rid of any focal infection, or treat the skin with antibiotics. We have used estrogens locally but not in alcoholic solution. We used them in ointments, mostly, following the suggestions in a Portuguese article published about a year ago which reported excellent results from the local use of estrogenic ointments. We have not obtained the results the Portuguese workers did. The result, if any, from this treatment is obtained very slowly. We have used vaccines, but the treatment I have described is so clean-cut, so definite, and so short that vaccines are not required; if treatment including the use of terramycin and these other things is followed out, they really are not needed. If there is a focus of infection, it is better to get rid of it than to treat it with vaccine. In most of these cases, the skin is sensitized either by the infection of the skin itself or by some focus to the Staphylococcus.

TREATMENT OF PSORIASIS WITH UNDECYLENIC ACID BY MOUTH

Herbert Rattner, M.D., Chicago
and
Harold Rodin, M.D., South Bend, Ind.

The clinical course of psoriasis has been recognized and described since the time of Celsus, but the cause of the disease still remains unknown. Psoriasis has been attributed to faulty metabolism of both proteins and fats, to parasitic and bacterial infections, to neurogenic disorders, to vitamin deficiency, and to dysfunction of the endocrine glands. A relationship with the arthritides has long been suspected. All these factors seemingly are unrelated, and treatments directed against them have given variable results. There has been no one drug or individual method of treatment that will cure psoriasis or even afford control of the disease in all cases with any degree of certainty. Because of the frequency with which the disease is encountered and the large problem that it presents, the announcement of a new remedy for psoriasis always arouses interest, and so Perlman's[1] first report on the peroral use of undecylenic acid for the treatment of psoriasis attracted considerable attention. This interest was acute, not only because of the favorable results that he reported but also because the treatment was altogether new, with no basis whatever from previous studies with the drug to suggest a rationale for its use in psoriasis. In fact, the drug was first used perorally by Perlman not for psoriasis but for ringworm of the scalp, a treatment that was suggested by the work of Rothman which explained the rarity of tinea capitis after the onset of puberty. Rothman[2] and his associates had demonstrated that "with the onset of puberty the sebaceous glands of the scalp start to secrete a sebum which contains in higher concentration than before, low boiling saturated fatty acids (of the nature of undecylenic acid) with selective fungistatic and fungicidal action on M. audouini." The treatment with undecylenic acid, incidentally, failed to cure the ringworm of the scalp, but

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This paper is the second in a "Symposium on Therapy," read before the Section on *Dermatology* and *Syphilology* at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 30, 1950.

[1] *Perlman, H. H.:* Undecylenic Acid Given Orally in Psoriasis and Neurodermatitis, J. A. M. A. **139**: *444-449 (Feb. 12) 1949.*

[2] Rothman, S.; *Smiljanic, A., and Weitkamp, S. W.: Spontaneous* Cure of Tinea Capitis in Puberty, J. *Invest. Dermat.* **8**: *81-98* (Feb.) 1947.

during the course of treatment it was noted that there was a profuse desquamation of the children's scalps, and it was this observation apparently which suggested the use of undecylenic acid for psoriasis.

In February, 1949, Perlman's first report was published. This was a study of a small series of 17 patients with chronic psoriasis who were observed for only a short period. Although he emphasized the preliminary character of the report, there was no mistaking Perlman's enthusiasm over the results that were obtained, and this same note of satisfaction ran through his two subsequent reports.[3] In the last of these he reported on his experience with a group of 100 cases as follows: good results in two-thirds of the cases, great improvement in associated arthropathy, and decided relief of itching in 51%. The reactions that he observed, although frequent, were considered to be bothersome rather than serious. "Concurrent topical therapy affected improvement more quickly but the end results were no better than when undecylenic acid was used alone."

The reports were not without interest and significance, and, as we are always alert for "something new for psoriasis," we undertook to use this method, adopting the same dosages that were recommended by Perlman. It soon became evident that our therapeutic results were in no way comparable with those that he had reported. We found that in our group of 40 cases only one showed any improvement. Then, too, we encountered not only a high incidence of gastrointestinal side-effects but also reactions of a more serious nature. There were three cases in which there was almost immediate exacerbation and spread of the disease. In two of the patients the spread continued unhampered to the development of exfoliative dermatitis, and one of these patients became so severely ill as to require hospitalization for treatment with pituitary adrenocorticotropic hormone. We learned through informal discussions with various members of the Chicago Dermatological Society that they also had failed to duplicate Perlman's results and that they, too, were encountering reactions.

The treatment in the meantime had been mentioned in several health columns in newspapers. General practitioners and persons afflicted with psoriasis began to make inquiries. It seemed important, therefore, for fear of prejudging the method, for us to enlarge our sphere of investigation, and questionnaires were then sent to dermatologists in all parts of the country asking specifically for information regarding the number and types of cases treated, the results, the reactions encountered, and considered opinions of the treatment. The men whose aid was enlisted are all experienced dermatologists acquainted with the vagaries of psoriasis. Most of them are qualified teachers of dermatology, and all of them are men of position in the specialty who are known to have serious judgment and not to be given to answering such questions lightly.

It is of interest to note that nine of the 75 dermatologists in this group had not used the treatment because it lacked a rationale. Forty-two of them reported on its use in 1,106 cases. Each case was observed for a period of at least three months, and each physician reported on from 20 to as many as 130 cases. In fairness to the treatment, it was decided to discard answers to the questionnaire that recorded results in fewer than 15 cases, doses smaller than those originally recommended, or a treatment period of less than 10 weeks. It was learned subsequently that these need not have been discarded because the results recorded for this group were similar in essential details to those for the entire group.

Side effects were recorded by nearly every observer. In general these were unimportant gastrointestinal disturbances—either nausea, vomiting, belching, a fishy taste in the mouth, fullness, diarrhea, or "heartburn." They were common symptoms and not unexpected, since undecylenic acid is related to castor oil. It is an 11-carbon, straight-chain unsaturated fatty acid, $CH_2CH(CH_2)_8COOH$, produced by splitting from the ricinoleic acid of castor oil by pyrolysis.[4] It has an objectionable fatty odor and an acrid taste. The symptoms produced by it were unpleasant and bothersome, but in most cases they could be controlled by lowering of the dose of the drug, by the discontinuation of treatment for a while, by a change to enteric-coated capsules, or by the administration of sodium bicarbonate, peppermint, or carbonated beverages. There were recorded also one instance each of headache, conjunctivitis, axillary adenitis, folliculitis, and acneform eruption. There were three cases of urticaria.

Not all of the side effects, however, could be considered inconsequential. In one instance a quiescent peptic ulcer was activated into serious hemorrhage, and in another there was exacerbation of a case of gout which had been quiescent. Recorded also were one case of auricular fibrillation and one of coronary pain, both of which disappeared when the use of the drug was discontinued and recurred when it was administered again. There were 11 cases recorded in which the psoriasis began to spread, not in the manner of a Herxheimer reaction but rather in that of a true exacerbation of the disease, the spread continuing in seven cases to the development of exfoliative dermatitis. The latter must always be considered a dangerous disease, involving as it does the reticuloendothelial system. These reactions, although serious, were nevertheless low in incidence, and their rare occurrence would ordinarily not hamper the use of the drug if the therapeutic results from it warranted its use.

Unfortunately, most of the observers found their results disappointing. Despite an occasional favorable response to the treatment, eight men recorded their

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3. Perlman, H. H., and Milberg, I. L.: Peroral Administration of Undecylenic Acid in Psoriasis, J. A. M. A. **140**: 865-868 (July 9) 1949. Greenbaum, S. S., and Perlman, H. H.: Further Observations with the Peroral Administration of Undecylenic Acid in the Treatment of Psoriasis, read before Section on Dermatology, Pennsylvania State Medical Society, Pittsburgh, Sept. 27, 1949.

4. Ereaux, L. P., and Craig, G. E.: The Oral Administration of Undecylenic Acid in the Treatment of Psoriasis, Canad. M. A. J. **61**: 361-364, 1949.

results as inconclusive, and four, although their results proved disappointing, felt the method should have a longer period of trial. The overwhelming opinion, however, from 38 of the physicians, was strongly critical of the treatment. They expressed their judgments in terms such as "absolutely worthless," "dangerous as well as worthless," "totally unimpressed," "decidedly ineffective," "very disappointing," "no longer use it," and "cannot recommend it." These comments are cited only because they are so emphatic. New drugs, new methods of treatment, or new interpretations of disease usually are met with some reservations, and differences of opinion are often freely expressed, but seldom are opinions stated with such vehemence as were those which have been cited. The significance of this fact is obvious.

At the meeting of the American Academy of Dermatology and Syphilology in December, 1949, these results were discussed before the section on pharmaceutical therapeutics and before the popular "Stump the Experts" panel, which was attended by some 500 members. The fact that more than half of the queries submitted to the panel dealt with the treatment of psoriasis with undecylenic acid gives some indication of the widespread interest in it. When Dr. Perlman rose to refute the results recorded on the questionnaires, his spirited defense of his treatment was received rather unsympathetically by the audience. But, of greater importance, he received open support from only one other physician, whose experience, as he himself pointed out, was limited to but eight cases. A few others "were not yet willing to condemn the treatment." In sharp contrast, the general tone of the comments heard at these sessions and informally through the several days of the meeting was unmistakably in agreement with those reported in the questionnaires, both in substance and in emphasis of expression. One observer told of a case of labyrinthitis [5] that resulted from the use of udecylenic acid; there were several reports of drug eruptions, reports of two instances of nephritis, and mention of quite a few additional cases wherein exacerbation occurred, sometimes to the development of exfoliative dermatitis.

COMMENT

Psoriasis is an erratic disease. Its course is not always one of relentless progression. It is capable of spontaneous exacerbations and remissions, and such remissions may last for years. It is often subject to seasonal variations and sometimes to emotional influences. It is a common observation that in some persons psoriasis will respond to almost any form of therapy and recurrences in the same patients may later resist the same therapy. It has been observed, too, that results from treatment often are directly proportional to the enthusiasm with which the treatment is administered. It would seem, then, that before any therapy can be evaluated for a disease such as psoriasis it must necessarily be tried on many types of cases and for a long period—years may be necessary for proper evaluation of a new treatment. It is easy to err in the direction of undue optimism. Perhaps one may err also in discrediting a treatment too readily. In this instance we think we have not, for we have made it a practice from time to time up to the past few weeks to inquire of our colleagues about their subsequent results from the treatment. Like us, not one has had reason to temper his original unfavorable opinion of it.

Unless experience with pituitary adrenocorticotropic hormone [6] and cortisone—which is only beginning—should prove to be successful, there is still no one method of treatment that will cure the disease or even afford certain control in all cases of psoriasis.

SUMMARY AND CONCLUSIONS

This report on the use of undecylenic acid by mouth for the treatment of psoriasis is based on the experience derived from its use in more than 1,100 cases. Eighty-five of these were treated by us; the others, by some 75 dermatologists from all sections of the country, who, in reply to a questionnaire, recorded results, reactions, and impressions following use of this treatment method. Because the clinical course of psoriasis is so unpredictable and erratic, and because the treatment with undecylenic acid is so new—the first report having appeared less than two years ago—only a status report can be made at this time.

A review of the answers to our questionnaire revealed that side effects occurred frequently. Most of them were unimportant gastrointestinal "upsets," but not a few cases were encountered in which there was a flare-up and spread of the psoriasis even to the development of exfoliative dermatitis. There were several isolated instances of other side reactions, too. Only a few of the physicians regarded their results as at all favorable, while several others were undecided and preferred to defer expression of a final opinion for a time. On the whole, however, the overwhelming opinion was decidedly unfavorable, some of the physicians recording their impressions in terms such as "worthless," "ineffectual," and "disappointing."

104 S. Michigan Ave., Chicago (Dr. Rattner).

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[5] Hand, E. A., and Wilkinson, C. F., Jr.: Toxic Labyrinthitis Following Oral Undecylenic Acid Treatment of Psoriasis: Report of a Case, J. Invest. Dermat. **14**: 227-228 (April) 1950.

[6] Hench, P. S.; Kendall, E. C.; Slocumb, C. H., and Polley, H. F.: Effects of Cortisone Acetate and Pituitary ACTH on Rheumatoid Arthritis, Rheumatic Fever and Certain Other Conditions: Study in Clinical Physiology, Arch. Int. Med. **85**: 545-666 (April) 1950.

General Practitioners and Scientific Exhibits.—The Scientific Exhibit at the meetings of the American Medical Association is administered by a committee of about 30 persons, headed by the Committee on Scientific Exhibit of the Board of Trustees. Each of the sections of the Scientific Assembly elects a representative to the Scientific Exhibit to assist and advise, in addition, there is a general advisory committee. Under such auspices, the best in medicine is shown at American Medical Association sessions, with leading physicians participating. One of the visiting British physicians attending the recent Atlantic City meeting said he was amazed to see how cheerfully the leaders in various branches of medicine make themselves available to the small-town practitioner. Nowhere else in the world is such consultation and advice possible.

BROMIDE INTOXICATION TREATED WITH AMMONIUM CHLORIDE

Theodore Cornbleet, M.D., Chicago

Many physicians believe bromides have fallen into disuse and newer drugs have completely replaced them. This is far from the truth—people take large amounts of these "old-fashioned" remedies continually. Authorities tell us bromides should be discarded, but physicians still prescribe them, and the public obtains them freely and easily in proprietaries and by name "over the counter." The habit that many develop of feeding at the "bromide bottle" can lead to evil effects that all should be aware of. The drug accumulates in the body sometimes to dangerous levels and then, on occasion, disaster results. The reason for dire effects is twofold: Many people keep taking a bromide without a let-up, and it is excreted slowly.

Bromides need not be taken for a very long time, however, or in large doses for evil effects to occur; a few persons seem more easily injured by this drug, and some call this facility "allergy." Large-enough accumulations, however, will harm anyone. People with bromide intoxication may show mental symptoms and at times need to be sent to institutions. Our patients, however, all had cutaneous eruptions, which can be of diverse forms and mimic the rashes of many other diseases. It is common knowledge that bromide eruptions are not uncommonly misdiagnosed. Most of us do not realize to what extent people take drugs (certainly bromides), and even if we should think of asking a patient about them, we accept his denial too easily. Dermatologists appreciate how difficult it is to wheedle a reliable drug history even from patients who are honest and eager to cooperate. After unearthing the fact that the patient's troubles are due to the bromides he has been taking, it is important—at times, lifesaving—for one to know how to displace them quickly.

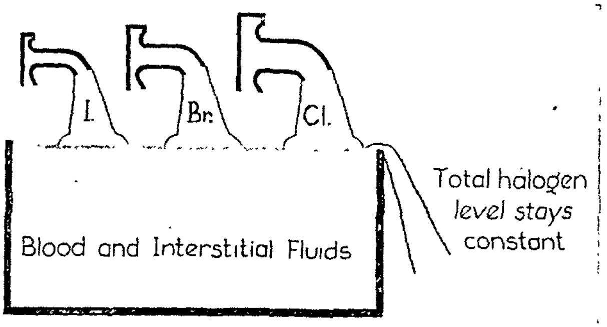
I.
Br.
Cl.
Blood and Interstitial Fluids
Total halogen level stays constant

Fig. 1.—The proportion of spill-over through the kidneys of any one halide to the others is the same as that in the total mass of blood, tissue, and tissue fluids. The total of chloride is so much greater than that of the other halides that at any one time bromide constitutes a relatively small proportion of the total halide washed out through the kidneys. It takes a long time until all the halides present in the body at any time are finally excreted and replaced.

To do this, we ought to know how the halides behave in the body. This will help us administer these drugs with better effect and less dangerously, too. The body makes little distinction in the handling of either bromide or chloride—it absorbs one as well as the other and distributes them in about the same manner. Their relative concentrations in the interstitial fluids depend on how much of each was ingested or injected and how much was there beforehand. The halides remain for the most part extracellular. Appreciable amounts are in the red cells, although little penetrates other cells. Just as with absorption and distribution, the body shows little distinction in the way it excretes bromides or chlorides. From a physical point of view, one halide will take the place of another.

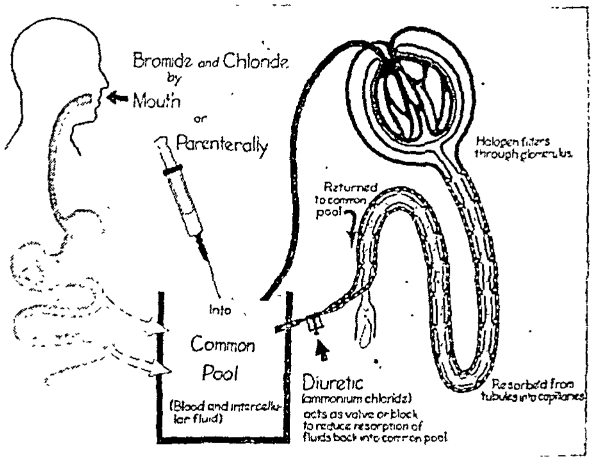
Bromide and Chloride by Mouth
or
Parenterally
Into
Common Pool
(Blood and intercellular fluid)
Halogen filters through glomerulus
Returned to common pool
Diuretic (ammonium chloride) acts as valve or block to reduce resorption of fluids back into common pool
Resorbed from tubules into capillaries

Fig. 2.—Chloride displaces bromide from the blood and tissues. Halides are filtered through the glomeruli but partly reabsorbed through the tubules. Acid diuretic chlorides prevent a part of the reabsorption back into the blood, thus sending more bromide out through the urine and hastening its depletion in the body.

Sollmann [1] says that bromide excretion takes place mostly through the urine but that some bromide gets into the feces. There is a small amount in milk and sweat, and some is present in the exfoliating epidermis. The rate at which bromide is excreted depends on its concentration in the fluids, the amount of other halide taken up to replace it, and the ability of the kidneys. O. Bodansky and Modell [2] found that mersalyl (salyrgan®) and theophylline step up the excretion of bromide and chloride. My associates and I found this, too, provided that the administration of a halide accompanied the giving of the diuretic. When there is no further uptake of bromide, less is excreted—at first, very little less. Later it clings to the body more and more, so that traces of it may remain afterward in the urine for as long as a month and even longer.

Chloride hastens the excretion of bromide by a sort of exchange process. That is why the ingestion of foods that contain little chloride retards the excretion of

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Read in a "Symposium on Therapy" before the Section on Dermatology and Syphilology at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 30, 1950.

[1] Sollmann, T.: A Manual of Pharmacology, ed. 7, Philadelphia, W. B. Saunders Company, 1948.

[2] Bodansky, O., and Modell, W.: Excretion and Storage of Bromide Ion, Am. J. Physiol. 133: 216, 1941.

bromide. Wagner and Bunbury[3] say that they found higher levels of bromide in the blood when they gave large doses of sodium chloride. They believe that the reason for this observation is that chlorides mobilize bromide from the tissues faster than the kidneys can excrete the latter halide. We did not find this to be so.

The knowledge that chloride will displace bromide from the body led to the use of sodium chloride for this purpose. The administration of sodium chloride by mouth and injection is today the standard treatment for bromide intoxication. It seemed to us that there might be some advantage in having a diuretic accompany the use of chloride for this purpose. Increased formation of urine could perhaps carry off more displaced bromide. One could use the popular mercurial diuretics, but doing so would add another remedy to the primary one (sodium chloride). Besides, there is some risk in using them. The acid diuretic chlorides, such as ammonium chloride, on the other hand, not only provide chloride but are diuretics at the same time. Moreover, they are relatively safe.

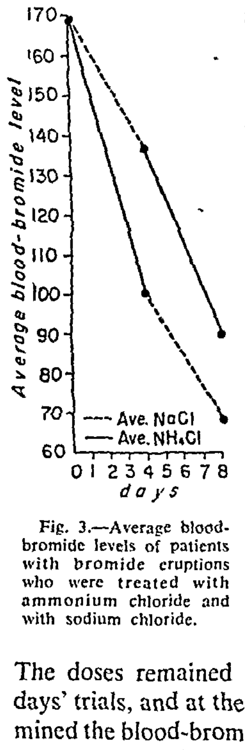

Fig. 3.—Average blood-bromide levels of patients with bromide eruptions who were treated with ammonium chloride and with sodium chloride.

In this study we compared the effects of these diuretic chlorides with those of sodium chloride (the standard for treating bromide intoxication) in a group of patients with bromide eruptions and volunteers who took bromides, to see whether the diuretic agents offered any advantage. We divided the patients into two groups: One received ammonium chloride for the first four days (6 gm. daily in enteric-coated tablets). At the end of four days we determined the blood-bromide levels and then started the second four days' tests. The group that began with ammonium chloride then received sodium chloride, while the one that started with sodium chloride changed to ammonium chloride. The doses remained the same during the second four days' trials, and at the end of this period we again determined the blood-bromide levels. In this way we continued to reverse each patient's and volunteer's treatment every four days until most of the bromide in each was gone. We believe that by arranging the experiments in this way we were able to make fair comparisons as to the relative efficacy of the diuretic chlorides and sodium chloride for removing bromide from the body (Table 1). There were five patients in the first experiment—four with acneform lesions, and the fifth with granlomas on the legs.

METHOD

The method of estimating the blood-bromide levels was the Taylor modification of Wuth's method as described by Todd and Sanford.[4]

Reagents.—Reagents used were as follows: (*a*) a 10% solution of trichloroacetic acid; (*b*) a 0.5% solution of gold chloride in distilled water, and (*c*) standard solution, prepared by the dissolving of 100 mg. of sodium bromide in 20 cc. of distilled water and then the addition of a 10% solution of trichloroacetic acid (*a*) to make 100 cc. One cubic centimeter of this standard solution is the equivalent of 1 mg. of bromide.

Technic.—The following technic was used: 1. Five cubic centimeters of blood was withdrawn by venipuncture and placed in a tube containing ammonium oxalate.

TABLE 1.—*Blood-Bromide Levels (Milligrams) in Subjects with Bromodermas Given Sodium Chloride or Ammonium Chloride in Alternating Periods*

Subjects	Initial Value	4 Days	8 Days	12 Days	16 Days	20 Days
A	184	N 142	A 90	N 61	A 27	.. ..
B	135	A 77	N 50	.. ..	.. ..	.. ..
C	68	N 52	A 29	.. ..	.. ..	.. ..
D	256	N 213	A 150	N 114	A 65	N 46
E	200	A 122*	N 88	A 51	.. ..	.. ..

* The asterisk indicates a five-day interval; *N*, the administration of sodium chloride, 6 gm. daily, in enteric-coated tablets, and *A*, the administration of ammonium chloride, 6 gm. daily, in enteric-coated tablets

Subject D had granulomatous lesions over the lower legs; the other four had acneform lesions.

2. Two or 3 cc. of oxalated blood was diluted with four times its volume of a 10% solution of trichloroacetic acid (*a*).

3. The mixture was centrifuged and filtered.

4. To 5 cc. of the filtrate, 1 cc. of a 0.5% solution of gold chloride (*b*) was added in a test tube.

5. Two cubic centimeters of the standard solution (*c*) was placed in a tube and trichloroacetic acid added to make 5 cc. Then 1 cc. of a 0.5% solution of gold chloride was added. Solutions were compared in a colorimeter with the standard set at 20.

Calculation.—The following was the calculation used:

$$\frac{20}{\text{reading of unknown}} \times 2 \times 100 = \text{mg. of bromide per 100 cc.}$$

RESULTS

The results of these tests on patients with bromide eruptions seemed to show that their blood-bromide level fell more rapidly when we treated them with ammonium chloride and more slowly with sodium chloride therapy (Figs. 3 and 4).

We made the second study on a group of seven volunteers. Each took 3 gm. of sodium bromide daily for seven days, and then we determined their blood-bromide levels. After this part of the study the seven subjects were divided into two groups—one of three and the other of four. We alternated their treatment

TABLE 2.—*Blood-Bromide Levels (Mg.) in Volunteers Given Three Grams of Sodium Bromide Daily for One Week Followed by the Administration of Sodium Chloride or Ammonium Chloride in Alternating Periods*

Subjects	Initial Value	4 Days	8 Days	12 Days
A	133	N 88	A 37	.. ..
B	75	A 35	N 22	.. ..
C	114	N 90	A 57	N 41
D	67	A 31	N 25	.. ..
E	86	N 70	A 42	.. ..
F	121	A 84	N 68	A 39
G	93	N 64	A 27	.. ..

A indicates the administration of ammonium chloride, 6 gm. daily, in enteric-coated tablets, and *N*, the administration of sodium chloride, 6 gm. daily, in enteric-coated tablets.

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[3] Wagner, C. P., and Bunbury, D. E.: Bromide Intoxication, J. A. M. A. 95: 1725 (Dec. 6) 1930.

[4] Todd, J. C., and Sanford, A. H.: Clinical Diagnosis by Laboratory Methods, ed. 11, Philadelphia, W. B. Saunders Company, 1948.

every four days, using diuretic chlorides and sodium chloride in turns, just as we did with the patients with bromide eruptions (Table 2). The results of this study again seemed to show that the blood-bromide levels fell more rapidly with ammonium chloride and less rapidly with sodium chloride (Figs. 5 and 6).

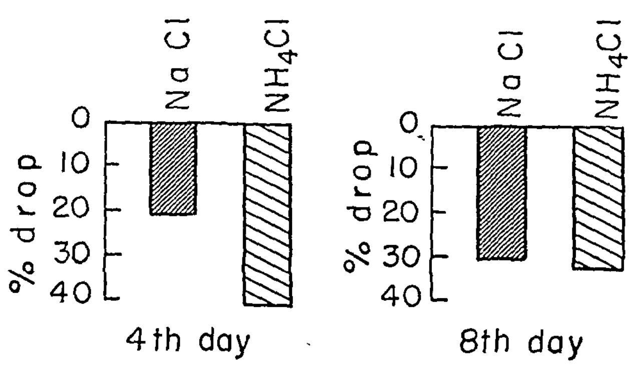

Fig. 4.—Percentages of drop in blood-bromide level observed on the fourth day and on the eighth day of treatment in patients with bromide eruptions treated with ammonium chloride and with sodium chloride.

One volunteer took 3 gm. of sodium bromide daily for two weeks and then received two injections of mersalyl a week apart. As with all the other patients and volunteers, we determined his blood-bromide levels every four days. The mercurial diuretic by itself seemed not to clear the blood of bromide any faster than did ordinary diets in three other volunteers (Tables 3 and 4). Evidently the diuretic needs chloride with it to hasten bromide excretion.

One volunteer took 3 gm. of sodium bromide daily for two weeks. When he finished with this, he drank fruit juice daily containing 60 gm. of urea. The administration of urea did not hasten the loss of bromide from his blood (Table 5). (We used urea because the liver forms it from ammonium, and this observation in itself could conceivably account for the action of ammonium chloride in our studies.) Perhaps we should have used the urea together with a chloride for a more adequate test.

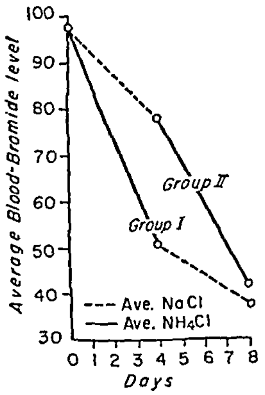

Fig. 5.—Average blood-bromide levels of volunteers treated with ammonium chloride and with sodium chloride.

COMMENTS

The whole purpose of the treatment of bromide intoxication is to hasten the removal of the halide. There are two main steps in doing this: The first is the displacement of the bromide from its combinations, and the second, its excretion. The total level of all the halides together in the blood and intercellular spaces remains at about a fixed level. The injecting or ingestion of chloride forces as much stored, combined halide into the urine. Water lost in dehydrating the body (sweat and urine) carries with it, too, these multiple halides. Obviously, this method alone has its limitations and is, otherwise, objectionable.

Diuretic chlorides have a dual action in removing bromides. They furnish chloride for displacing the bromide and at the same time are diuretics. We believe ammonium chloride is the most advantageous one to use. It is simple, cheap, and fairly safe. It should not be used when the kidneys are damaged. The enteric-coated tablets are not irritating to the stomach, and most people can take a total of 5 to 8 gm. a day in divided doses without distress.

There are several ways to explain the action of the diuretic chlorides in increasing urine formation. According to a modern theory, chloride filters through the kidney glomeruli, but more than 99% of this filtrate is reabsorbed back into the system by way of the kidney tubules. When ammonium chloride, for example, is given as the diuretic, the liver converts the ammonium into urea. There remains then an excess of chloride, and this the tubules refuse to reabsorb from the urinary filtrate. There is a limit to the amount of strong acid the kidneys can excrete, and so some of the chloride is neutralized by sodium or a fixed base. Compensatory factors acting through the posterior lobe of the pituitary body and the adrenal cortex cause an equivalent amount of water to leave with the sodium.

TABLE 3.—*Blood-Bromide Levels Observed in Volunteer Given Three Grams of Sodium Bromide Daily for Two Weeks Followed by Administration of Mersalyl Twice, with an Interval of a Week*

Days from Start	Blood-Bromide Level, Mg.
15	173*
19	149
23	128*
27	105

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* The asterisk indicates administration of mersalyl.

TABLE 4.—*Blood-Bromide Levels in Volunteers on Ordinary Diet, After Treatment with Three Grams of Sodium Bromide Daily for Two Weeks*

Days from start	..	15	19	23	27
Blood-bromide level, mg	A	214	179	148	121
	B	186	...	128	107
	C	220	182	150	...

TABLE 5.—*Blood-Bromide Levels Observed in Volunteer Given Sodium Bromide, Three Grams Daily for Two Weeks, Followed by the Administration of 60 Grams of Urea in Fruit Juice Daily*

Days from Start	Blood-Bromide Level, Mg.
15	204
19	167
23	140
27	111
31	82

The body can detoxify many drugs by conjugation or other process. In bromide intoxication, however, the offender must be excreted. This fact explains, too, why the untoward actions of this halide may persist. Since more than 99% of the halide filtering through the glomeruli gets back to the blood, the bromide must make many trips to the kidneys before all of it ultimately stays in the urine. This bromide and its larger ratio of chloride together require a long time for removal by this piecemeal excretion process. Another factor that probably acts to retard the loss of bromide is the presence of some of the substance within the red cells. This amount is not filtered directly. As the plasma-bromide level falls, some of the halide in the erythrocytes leaves and is taken up by the fluid pool and is then subject to kidney filtration. This observation probably accounts for an appreciable time lag.

Some kinds of lesions naturally heal more quickly than others. The small acne-like lesions from bromide clear away quickly after the patient stops taking his medicine. The large, fungating granulomas on the legs, however, take much longer to resolve. But, then, most granulomas are torpid, and lesions on the legs take longer to heal than their counterparts elsewhere.

SUMMARY

We made clinical and experimental observations on patients with bromide eruptions and volunteers. The therapeutic abilities of the acid diuretic chlorides (ammonium chloride) and sodium chloride for displacing blood bromide were compared. We found that bromide is excreted and lesions heal faster with ammonium chloride than with sodium chloride treatment. The theory of chloride action in combating bromide intoxication is briefly outlined and discussed.

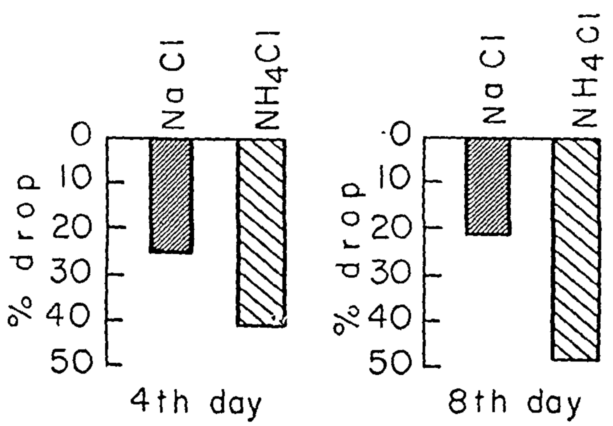

Fig. 6.—Percentages of drop in blood-bromide level observed on the fourth day and on the eighth day of treatment in volunteers treated with ammonium chloride and with sodium chloride.

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ABSTRACT OF DISCUSSION

Dr. C. P. Bondurant, Oklahoma City: I should like to congratulate Dr. Cornbleet on his fine study of bromide retention. My interest in this subject has been of long standing, and I realize that this type of investigation requires much detailed attention. Since my work on the use of the cortical hormone with reference to bromide excretion, I have seen an increasing number of cases of bromide intoxication. Dr. Cornbleet's point as to who takes bromides is well put. This drug is more widely used than we suppose. Laymen, druggists, and many physicians are still not alert to the dangers of this so-called mild sedative. The warnings and legislation which exist against the barbiturates have driven many to the use of the unrestricted bromides, and when we review the list of commonly used remedies which contain bromides, we are not surprised at the number of bromide-retention cases which are seen. We need legislation regulating the sale of bromides the same as has been enacted for barbiturates. If we can do nothing other than to put that point over to the public in this paper, our efforts will be well spent. It is generally accepted that a blood-bromide level of 150 mg. is necessary for the production of psychotic symptoms, but this high a level is not needed for the dermatological lesions. I am sure all of us have seen flare-ups in these cases with continued use of bromides. The statement that the body must be rid of all its bromide is fundamental in this type of therapy. I cannot quite go along with Dr. Cornbleet on the idea that a blood-bromide level of 22 to 30 mg. is all right. In handling this type of therapy, we must rid the body of its bromides if we are to rid it of its symptoms. A study of the spinal fluid is most interesting. The chemical exchanges in the spinal fluid are slow in comparison with those in the blood and other tissues and account for the prolonged time necessary for recovery in intoxication cases. We might say that the spinal fluid acts as a reservoir and, as its bromides are unloaded into the system, an exacerbation of the condition in the spinal fluid may be caused. One of my colleagues, who is a professor of pharmacology, determined the bromide level on some spinal fluid taken at autopsy and found it to be 400 mg., which observation shows that bromides not only are intoxicating but can produce fatal outcome in these cases. We try to include a spinal-fluid examination in all cases of bromide intoxication, and here I might suggest, as a further treatment of bromide intoxication, and particularly the cases with psychotic symptoms, that repeated spinal drainage is a good procedure. Repeated spinal drainage should have a place in the treatment of all bromide-intoxication cases that have gone to a state where they include any type of mental disturbance. Dr. Cornbleet has shown that the use of a diuretic chloride is superior to the old sodium-chloride method used alone, and he is to be commended on this observation. The addition to this therapy of cortex-hormone will aid these patients considerably. I believe that more work is necessary to determine the proper range of dosage of ammonium chloride in these cases. The use of this type of replacement therapy is not without some dangers. Since many bromide-takers are abnormal otherwise, complete blood-chemistry and kidney-function investigations are necessary. This work establishes clearly the superior therapeutic effect of ammonium chloride over the mercurial diuretics, the latter endangering the chloride reserve. Nature's own diuretic, water, should be used freely, but with due regard to kidney function. Much valuable data could be gained if we extended this study and not only recorded the blood-bromide level but also examined each specimen for sodium, potassium, and chloride content as well.

Dr. Theodore Cornbleet, Chicago: Harris and Derian have called attention to the fact that chronic bromide intoxication presents a syndrome similar to that of pellagra. They gave their patients nicotinamide and obtained gratifying results. They recommend that this vitamin factor be given alone in cases of cardiac decompensation when sodium chloride is contraindicated. Ammonium chloride, too, might be useful in such cases, I believe. Cortisone and other cortical steroids influence sodium and potassium chloride (and, of course, bromide) retention and excretion. They will provide, no doubt, another means to combat bromide intoxications. I think, however, for the present, that the use of ammonium chloride provides us with a simple method for quickly removing bromides from the body.

Writing Medical Papers.—Sir William Osler, although his short intelligible papers in simple English do not show the signs of effort, often rewrote his papers six or eight times in longhand before they were typed for the first time. Sir Clifford Allbutt thought it reasonable to go over a paper about nine times. Tolstoy said, "I cannot understand how anyone can write without rewriting everything over and over again." . . . Dr. William H. Welch told his classes that almost all of the great discoveries in medicine were reported in articles of less than 3,000 words. . . . However, accuracy and clarity should not be sacrificed in an attempt to achieve brevity. You owe your reader a complete explanation.—Miley B. Wesson, Writing a Medical Paper: Why and How, *Journal of Urology*, April, 1951.

ASPHYXIA NEONATORUM

NEW METHOD OF RESUSCITATION

Allan Bloxsom, M.D., Houston, Tex.

The purpose of this study is (*a*) to examine critically the present methods of resuscitation of the asphyxiated newborn infant and (*b*) to present the results of a new method of resuscitation using positive pressures in an oxygen air lock for oxygenation and the expansion of gases to expel pulmonary fluids and secretions.

The material for this study consisted of 100 asphyxiated newborn infants delivered by members of the obstetrical staff of St. Joseph's Maternity Hospital during the period Jan. 4 to May 4, 1950. During this period there were 1,786 deliveries, which gives an incidence of one in every 18 newborn infants requiring resuscitation. In every 100 deliveries approximately six infants were sufficiently asphyxiated to require special resuscitative measures.

Behind the physiological curtain of a considerable degree of cyanosis,[1] consisting of an average mean capillary unsaturation of more than 6.5 vol. % of oxygen in which the fetus exists in utero normally before birth, exists a mechanism that at the start of labor places the fetus under pressure, increases at intervals the oxygenation of the fetal blood,[2] maintains adequate heat and moisture, and provides stimuli to initiate respirations.[3]

The purpose of labor is believed to be twofold. That which is most obvious is the birth of the infant. The hidden purpose is found in the prelabor contractions and resulting pressures leading to respiratory efforts.[4] Pressures generated at labor serve as an important part in the conditioning of the fetus [3] to start his respirations promptly. The final mechanical squeezing of the infant's chest by the birth canal when the head has been delivered, which obstetricians have observed on many occasions, serves in the immediate expulsion of fluids from the pulmonary tree as a concluding step in the preparation for respiration.

The mechanism of this conditioning of the fetus by the mother is believed to be (*a*) a washing in and out of amniotic fluid by a minute tidal wave in an effort to prevent atelectasis at birth by a predelivery expansion of the alveoli in fluid and (*b*) a variation in the pressure gradients of oxygen and carbon dioxide to condition and stimulate the respiratory center. The above chain of events opens the short second act in the newborn infant's life during labor and should be considered the initiation of his "operation oxygenation."

Asphyxia neonatorum results when the events and forces operative to introduce oxygen into the fetus and newborn infant are lacking, or a physiological barrier is produced causing anoxia. Anoxia may be classified generally as anoxic, anemic, stagnant, or histotoxic. Specifically, a few of the clinical conditions resulting in asphyxia neonatorum are narcotization, effects of certain types of anesthetic, prolonged periods of anesthesia, prolonged periods of anoxia resulting from the premature separation of the placenta, prolapsed cord, cord about the infant's neck, lack of labor pressures in cesarean section, and certain toxemias of pregnancy disturbing the pressure gradients of oxygen and carbon dioxide between the mother and the fetus. Eastman [5] found that in the severely asphyxiated infant the oxygen content of the umbilical vein averaged 1.3 vol. % and the carbon dioxide tension 61.6 mm. of mercury.

The immediate problem of relieving the asphyxia neonatorum and resuscitating the handicapped infant resolves itself, therefore, into one of not only getting the respiratory center to function properly in the presence of a severely disturbed blood concentration of oxygen and carbon dioxide, but preventing a damaging anoxia of the cells of the central nervous system until adequate external respiration will provide sufficient oxygenation of the blood for adequate internal respiration.

After a study on the difficulty of beginning respiration seen in a series of cesarean section infants,[3] the thought occurred that the varying positive intrauterine pressures had an essential and important part in oxygenation and preparation of an infant to initiate quickly his respiration, both external and internal after a normal delivery. It seemed reasonable that if a means could be constructed to enable the newborn infant having difficulty in beginning oxygenation and adequate respirations to assume once more the pressure conditions existing in utero during labor and, at the same time, be supplied heat, moisture, and oxygen and exposed to slow, gentle chest respiratory exercises, similar to those he received in utero from changes in pressure, there might be a more favorable outcome, with regard to not only the infant's immediate existence but the future development of his central nervous system. Accordingly, a positive-pressure oxygen air lock [6] was constructed (Fig.) to contain the asphyxiated infant, furnish him with heat, moisture, increased oxygen concentrations for peripheral absorption, and pressures, together with a cycling of those pressures simi-

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The positive-pressure oxygen air lock was manufactured by the Loewenstern Corporation, Houston, Tex.

The members of the Obstetrical Service and Sister Carmen of St. Joseph's Maternity Hospital helped to make this study possible.

Read before the Section on Pediatrics at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 29, 1950.

From the Department of Pediatrics, the St. Joseph's Children's Hospital, and the Department of Pediatrics, Baylor University College of Medicine.

[1] Eastman, N. J.: Foetal Blood Studies: I. The Oxygen Relationships of Umbilical Cord Blood at Birth, Bull. Johns Hopkins Hosp. 47:221, 1930.

[2] Windle, W. F.: Physiology of the Fetus: Origin and Extent of Function in Prenatal Life, Philadelphia, W. B. Saunders Company, 1940, p. 75.

[3] Bloxsom, A.: The Difficulty in Beginning Respirations Seen in Infants Delivered by Cesarean Section, J. Pediat. 20:215, 1942.

[4] Ahlfeld, F.: Die intrauterine Tätigkeit der Thorax- und Zwerchfellmuskulatur, intrauterine Atmung, Monatsschr. Geburtsh. u. Gynaek. 21:143, 1905.

[5] Eastman, N. J.: Foetal Blood Studies: III. The Chemical Nature of Asphyxia Neonatorum and Its Bearing on Certain Practical Problems, Bull. Johns Hopkins Hosp. 50:39, 1932.

[6] Bloxsom, A.: Resuscitation of the Newborn Infant: Use of the Positive Pressure Oxygen-Air Lock, J. Pediat. 37:311, 1950.

lar as far as possible to those he might receive during the second stage of labor. Table 1 shows the advantages that might be expected from positive-pressure oxygen air resuscitation of the asphyxiated newborn infant.

The first 100 asphyxiated newborn infants oxygenated and resuscitated in an oxygen air lock were in a group of 1,786 deliveries at the St. Joseph's maternity Hospital in Houston, Tex., from Jan. 4 to May 4, 1950. The immediate results of treatment in these 100 asphyxiated newborn infants are shown in Table 2.

TABLE 1.—*Advantages of Positive-Pressure Air Resuscitation of the Asphyxiated Newborn Infant*

1. Promotes bronchial drainage by the expansion of gases for the expression of fluids and secretions in the pulmonary tree
2. Provides a more uniform alveolar aeration
3. Increases absorption of oxygen through the skin and upper respiratory passages
4. Relieves and protects against atelectasis
5. Provides gentle breathing exercise and improves muscle tone
6. Combats acute pulmonary edema
7. Provides favorable conditions for the diffusion and use of oxygen by the premature infant
8. Disposes of handling of infant on part of the physician or nurse

TABLE 2.—*Resuscitation of One Hundred Asphyxiated Newborn Infants Among 1,786 Deliveries*

	Number		Alive		Dead	
Weight at Birth, Gm.	M	F	M	F	M	F
400 to 1,000	6	6	0	1	6	5
1,001 to 2,500	23	17	15	15	8	2
2,501 and above	28	20	25	20	3	0
Total	57	43	40	36	17	7

During the four-month period this study was carried out, a total of 34 newborn infants died in this hospital. Ten of the newborn infants who died were not placed in the air lock, either because there was not a lock available or because the physician in charge did not order this method of resuscitation. At first the lock was used in a number of cases as a measure of last resort; the infants were deeply cyanotic many minutes past the time of delivery, and the irreversible changes described by Schmidt [7] had occurred in numerous instances. One of the infants was to all purposes dead, and no heart beat could be elicited when it was placed in the lock. Heart beats and respiration, of course, could not be established.

TABLE 3.—*Mortality Rates for January, February, March, and April, 1949 and 1950*

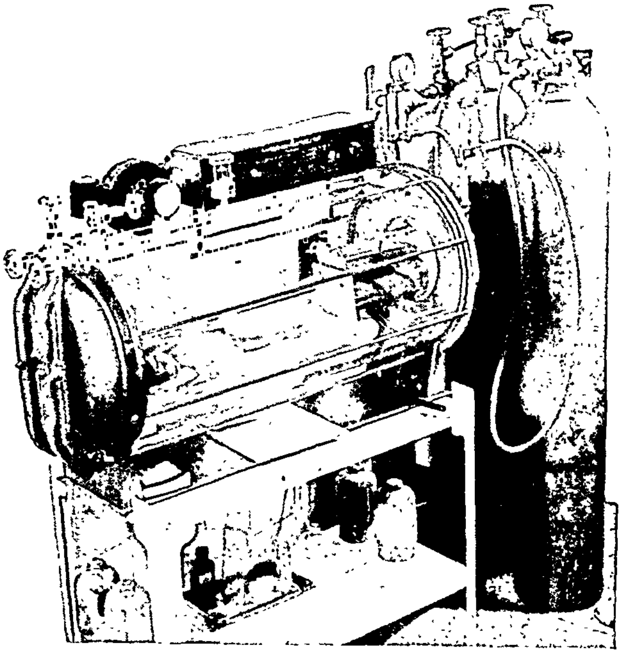
	1949	1950
Number of infants delivered	2,000	1,786
Stillbirths	39	25
Deaths (other than stillbirths)	50	34
Death rate (excluding stillbirths)	2.5%	1.9%
Change in death rate	Decrease 25%	

TABLE 4.—*Time Required in Air Lock*

	Time, Hr.															
	1		2		4		8		12		24		48		Above	
Weight at Birth, Gm.	L.*	D.*	L.	D.	L.	D.	L.	D.	L.	D.	L.	D.	L.	D.	L.	D.
400 to 2,500	2	2	5	4	5	4	4	1	0	2	6	6	4	0	5	0
2,501 and above	15	1	15	0	7	0	6	0	4	1	0	1	0	0	0	0

* *L.* indicates living and *D.* dead.

The mortality rates of the first four months of 1949, when the air lock was not used, and the first four months of 1950, when it was in use for the obstetricians who desired it in the St. Joseph's Maternity Hospital, are given in Table 3. The associated decrease of 25% in the death rate of the living newborn infants since the oxygen air lock was first used has to be examined for other possible favorable factors operative to reduce the death rate in any hospital. One major factor is the decrease in the number of premature infants delivered. During the first four months of 1950 the incidence of premature deliveries dropped to 5.15 from 5.95% in 1949. This decrease would account for some of the favorable decrease in the infant mortality rate, provided the premature birth weights were in both years comparable. However, the incidence of very small premature infants delivered weighing 1,000 gm. or less increased about 50% in 1950 as compared with 1949. A very high percentage, about 85%, of the premature infants weighing 1,000 gm. or under die. The reduction in premature delivery rate that favorably influences the infant mortality rate has been neutralized to some extent or done away with by the great increase in deliveries of premature infants weighing 1,000 gm. or less. It is believed, therefore, that there has been an actual decrease in the death rate of the newborn infants in this hospital associated with the use of the positive-pressure oxygen air lock.



Positive-pressure air lock.

Table 4 shows the time required by the 100 asphyxiated newborn infants in the air lock. It is interesting to note that all premature infants living more than 24 hr. survived. The great majority of deaths of premature infants occurred 2 to 4 hr. after delivery. The majority of the full term infants died 12 to 24 hr. after delivery. Once a premature infant reached the 24-hr. mark he required four to 10 days to establish adequate oxygenation and respirations. One edematous infant was left in the lock for 80 hr. before administration of fluids was considered advisable. Several premature infants were left in the lock 48 hr. until the skin appeared nonedematous.

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[7] Schmidt, C. F.: Influence of Cerebral Blood-Flow on Respiration: Respiratory Responses to Changes in Cerebral Blood-Flow, Am. J. Physiol. 84:202, 1928.

COMMENT

Henderson [8] states:

> The first quarter of an hour after birth is the most dangerous period of life. Its mortality is as great as that of any subsequent month. No single discovery in medical science or improvement in practice could do more to save lives than would measures to avoid the losses that now occur within a few minutes after birth.

Eastman [5] insists that "there seems to be only one urgent indication in the treatment of asphyxia neonatorum, and that is to introduce oxygen into the circulating blood of the infant." In addition, it seems to me that a number of the asphyxiated infants are in considerable shock, cold and listless, with all the tissues of the body in poor tone. The correction or prevention of further increase in shock, the increase of the infant's blood pressure, and the increase in tissue turgor, are all quite necessary, in addition to the introduction of oxygen into the asphyxiated newborn infant.

TABLE 5.—*Results of Use of Expansion of Gases to Remove Pulmonary Fluids and Secretions in One Hundred Asphyxiated Infants*

	Living		Dead	
Weight, Gm.	M	F	M	F
400 to 2,500	4	7	3	1
2,501 and above	6	2	0	0
Total	10	9	3	1

The relieving of the anorexia of the asphyxiated infant can be considered the infant's "operation oxygenation" and appears to take place easier when there is a positive pressure to increase the rate of diffusion of the oxygen and carbon dioxide molecules. These pressures in the air lock have been made to correspond roughly to the relative intrauterine pressures found by Salerno.[9] The lack of a variation of these positive intrauterine pressures in infants delivered by cesarean section has resulted in an increase in difficulty in beginning respiration of approximately 25%.[3] Prelabor contractions were observed by Windle [2] to be accompanied with an improvement in the color of the umbilical vein. The frequent slowing down of the fetal heart beat at the height of labor contractions in the early part of the labor probably indicates a hyperoxygenation of the fetus. The subsequent increase of rate with the relaxation of the uterine contraction means once more a state of relative anoxia. Toward the end of labor, when the pressures are such that the uterine arteries and veins are embarrassed, the above conditions are probably reversed.

With the condition of shock in which these infants often appear to be, it seems logical that the stagnation of the blood in their lungs makes it more difficult to absorb oxygen and give up carbon dioxide. It may well be that a number of asphyxiated infants who were thought to have atelectasis are in a considerable degree of shock, with an impairment of their pulmonary circulation, and can use oxygen only under difficulty. Eastman [5] states that the oxygen content of the umbilical vein blood at birth may occasionally fall to 5 vol. % without the infant showing clinical evidence of asphyxia. In his series of severely asphyxiated infants [5] the oxygen of the umbilical vein blood varied from 0 to 2.9 vol. %. The active transport of oxygen by the air lock under a physiological pressure and with the removal of carbon dioxide offers a safe means of resuscitation involving no exhausting physical effort on the part of the resuscitating physician to supply oxygen and no crippling activity on the infant's part to use that oxygen. Eastman [5] warns against using physical stimulation when the infant is cyanotic and, as stated previously, insists that the essential treatment of asphyxia neonatorum is the introduction of oxygen into the circulating blood of the infant.

It is believed that the asphyxiated newborn infant can absorb considerably more than 10% of his oxygen requirements through his skin. It is known that this amount [10] can be absorbed by diffusion through the skin of the adult unclothed and surrounded by an atmosphere of 100% oxygen. The initial relief of cyanosis seen in many infants when they are placed in the lock under increased pressure suggests that a considerable amount of oxygen is absorbed through the skin and upper respiratory passages.

It has been thought that many of these asphyxiated infants could not breathe because of the presence of a tracheal or bronchial plug of mucus or fluid, and that the use of a tracheal catheter or the bronchoscopic examination, with the subsequent removal of the plug and the carrying of oxygen down the trachea, would be of value.[11] Potter [12] states, however, that

> The presence of excessive amounts of amniotic fluid within the lungs at the time of birth is of little consequence and does not interfere with the entrance of air. The rich capillary bed of the alveolar walls absorbs fluid rapidly, and air probably enters as easily as if excessive amounts of fluid had not been inspired.

This has been my experience in the resuscitation of asphyxiated infants with the air lock.

House and Owens,[13] on bronchoscopy of 23 infants, were able to find in only one case a plug of exudate in a single bronchus. A progressive improvement in the infant's respiration, with complete relief taking place most frequently from 6 to 8 hr. after instrumentation, occurred in the authors' series of asphyxiated infants.[13] Prompt relief does not occur at once, which clearly shows that it is theoretically and practically impossible to remove enough pulmonary fluids for immediate relief of the asphyxiated newborn infant by means of a tracheal tube, whether a bronchoscope or a tracheal catheter.

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8. Henderson, Y.: The Prevention and Treatment of Asphyxia in the Newborn, J. A. M. A. **90**:583 (Feb. 25) 1928.
9. Salerno, J. P.: Observation on Intrauterine Pressure During First Stage of Labor, Am. J. Obst. & Gynec. **36**:294, 1938.
10. Doak, E.: Personal communication to the author.
11. Best, C. H., and Taylor, N. B.: The Physiological Basis of Medical Practice: A Text in Applied Physiology, ed. 5, Baltimore, Williams & Wilkins Company, 1950, p. 358.
12. Potter, E. L., and Adair, F. L.: Fetal and Neonatal Death: A Survey of the Incidence, Etiology and Anatomic Manifestations of the Conditions Producing Death of the Fetus in Utero and the Infant in the Early Days of Life, ed. 2, Chicago, University of Chicago Press, 1949, p. 18.
13. House, H. P., and Owens, H.: Atelectasis of the Newborn: Treatment by Bronchoscopic Drainage, J. Pediat. **28**:207, 1946.

Removal of pulmonary fluids must be accomplished by the infant or through expansion of gases to express fluids and secretions.

This means of expelling pulmonary fluids by the expansion of gases is the best theoretical and practical method available at present. Table 5 shows the results of the use of expansion of gases to expel fluids and secretions in this series of 100 asphyxiated infants. A total of 23 infants in the series expelled pulmonary fluids. The quantity of these fluids varied from a few cubic centimeters to very large amounts. For the most part, the fluids were clear and frothy, but in a few instances they appeared to be mucopurulent. Two infants expelled blood-tinged mucus, one of whom had been initially resuscitated with the use of a tracheal catheter and as a last resort placed in the air lock. After an initial period of benefit, the respirations became greatly embarrassed and he was removed from the air lock. It was found that this infant had a pneumothorax, and at autopsy three puncture wounds were observed in the lower lobe of the right lung.

Brief postmortem studies on 10 of the 24 infants processed in the air lock are given below.

Baby J., a boy of 30 weeks' gestation, weighed 3 lb. 12 oz. (1,701 gm.) after breech delivery with double footling presentation. He lived 24 hr. Autopsy diagnoses were slight subdural hemorrhage, slight subarachnoid hemorrhage, hyaline membrane in lung, and bilateral atelectasis.

Baby R., a boy of 34 weeks' gestation, weighed 4 lb. 9 oz. (2,070 gm.) after breech delivery. He lived 23 hr. 45 min. Autopsy diagnoses were subdural and intraventricular hemorrhage, bilateral tear of tentorium cerebelli, edema of the brain, partial atelectasis of lung, and petechial hemorrhages into the heart.

Baby E., a boy of 30 weeks' gestation, weighed 4 lb. 15 oz. (2,240 gm.) after low forceps delivery. He lived three days after removal from the air lock and died of erythroblastosis fetalis, kernicterus, and partial atelectasis.

Baby S., a boy of 38½ weeks' gestation, weighing 6 lb. 10 oz. (3,005 gm.), was delivered spontaneously. He lived 12 hr. Anatomic diagnoses were erythroblastosis fetalis and atelectasis of lungs.

Baby K., a boy of 34 weeks' gestation, weighed 3 lb. 15 oz. (1,786 gm.) after breech delivery. He lived 4 hr. 15 min. Diagnoses at autopsy were tear of tentorium cerebelli, subdural hemorrhage, and atelectasis of lungs.

Baby C., a boy of 40 weeks' gestation, weighed 8 lb. 12 oz. (3,969 gm.) after breech delivery. He lived 22 hr. Autopsy diagnoses were hemorrhage into the right side of the chest, fracture of left clavicle, tear of tentorium cerebelli, subdural hemorrhage, and bullous emphysema.

Baby M., a boy of 38 weeks' gestation, weighing 5 lb. 6 oz. (2,438 gm.), lived 5 hr. 30 min. after midforceps delivery. Diagnoses on autopsy were tear of tentorium cerebelli, subdural hemorrhage, right pneumothorax, right parenchymal hemorrhage, and multiple focal areas of atelectasis on both sides. The right lung showed three minute rents near the anterior lateral margin of the lower lobe.

Baby B., a girl of 36 weeks' gestation, weighing 4 lb. 10 oz. (2,098 gm.), was delivered by cesarean section because of placenta previa. She lived 6 hr. The autopsy diagnoses were bilateral atelectasis and multiple subpericardial hemorrhages.

Baby M., a boy of 28 weeks' gestation, weighed 2 lb. 4 oz. (1,021 gm.). There was prolapse of the cord, with a double footling breech delivery. The diagnosis on autopsy was internal hydrocephalus.

Baby D., a boy of 23 weeks' gestation, weighing 1 lb. 15 oz. (878.8 gm.), was delivered spontaneously. He lived 2 hr. 14 min. The autopsy diagnosis was atelectasis.

In the above group of 10 infants studied at autopsy, five had tentorial tears, in four instances associated with a breech delivery. Two infants had severe erythroblastosis fetalis, and one a congenital malformation of the brain. No bronchial secretions or tracheal plugs were seen in any of these autopsied infants.

Table 6 shows the results from use of the tracheal catheter.

In the group of 24 infants in this series subjected to tracheal catheterization, expansion of gases in the air lock removed fluids in only four. In the group of 23 infants from whom fluids were removed by the expansion of gases, the tracheal catheter was used but four times. This suggests that it is impossible for the resuscitating physician to determine to any degree of accuracy which infant the tracheal catheter theoretically might benefit. Even with using it in the correct infant, the physician may not be able to remove much of the pulmonary fluids and secretions. The risk of trauma is so great that tracheal catheterization is associated with a considerably increased mortality, and an occasional puncture of lung or stomach occurs. It is hoped that the use of this instrument, even in intelligent hands, be discontinued in view of the above findings.

TABLE 6.—*Use and Nonuse of Tracheal Catheter for Oxygenation and Removal of Pulmonary Fluids in Premature Infants*

	Tracheal Catheter Used in Resuscitation		Nonuse of Tracheal Catheter	
Weight, Gm.	Living	Dead	Living	Dead
1,500 to 2,500	4	3	24	6
Per cent	57	43	80	20

The increased hydration with edema, seen so frequently in the newborn premature infant, makes its appearance quite early in many of the premature infants placed in the air lock. It is thought that the premature infant easily shifts his vascular fluids to the extracellular spaces because of his low blood-serum proteins, particularly albumin. This accounts for the excess hydration at birth and later loss of weight during the first few days of life. The atelectatic and immature lung of the premature infant probably absorbs more pulmonary fluid in proportion than the mature lung of the full term infant.

The amount of tissue hydration occasionally seen in the premature infant placed in the air lock does not seem to be more than that produced by labor contractions in the premature infant spontaneously starting his respirations and not requiring the air lock. This increased hydration may be of considerable physiological value to the premature infant in the first few days of life, in that administration of fluids does not have to be started immediately. This gives the premature infant a chance to become accustomed to extrauterine life without a great deal of handling and manipulation.

A few infants have been observed to show an unusually prompt physiological jaundice. This is believed to be caused by an early and adequate oxygenation, leading to a quick destruction of the excess blood in the newborn infant.

SUMMARY

A preliminary report is made on a series of 100 asphyxiated newborn infants, occurring in a group of 1,786 deliveries, resuscitated by a positive-pressure oxygen air lock.

The initial absorption of oxygen through the skin and upper respiratory tract is most important. Increasing the pressure of oxygen available for this method of absorption is a vital step in resuscitation.

The expansion of gases expels fluids and secretions from the upper respiratory tract and lungs in approximately one of four asphyxiated newborn infants. The expansion of gases to expel fluids and secretions from the upper respiratory tract and lungs makes unnecessary the use of tracheal suction with its attendant trauma. The use of the tracheal catheter should be discontinued because of an abnormally high associated mortality.

Positive-pressure resuscitation subjects the asphyxiated infant to no physical stimulation on the part of the physician or nurse.

The positive pressure employed by the mother in labor and used in this study subjects the asphyxiated infant to no danger and has been continued for periods as long as 10 days for the premature infant.

The mortality rate in a large maternity hospital has been lowered with the associated lowering of the incidence of premature deliveries and the use of the positive pressure oxygen air lock in the resuscitation of the asphyxiated newborn infant.

ABSTRACT OF DISCUSSION

Dr. Arthur H. Parmalee, Beverly Hills, Calif.: I believe the premises on which Dr. Bloxsom's method is based need to be reviewed in order to evaluate it properly. Discussion of the mechanisms involved in the initiation of respiration in such texts as Windle's "Physiology of the Fetus," Smith's "Physiology of the Newborn," or Barcroft's "Researches on Prenatal Life," reveals the uncertain state of knowledge about what actually goes on in the initiation of postnatal pulmonary respiration. Smith aptly stated the case in these words: "Until we know why most babies breathe when they emerge from the uterus we shall scarcely be sure why some babies do not." Oxygen is the fundamental need of the asphyxiated newborn. Dr. Bloxsom's method accomplishes at least two things that are advantageous to the infant: First, it favors absorption of oxygen through the skin and the mucous membrane of the upper respiratory tract, sufficient perhaps to tide the baby over until such time as respirations may spontaneously begin. Second, it certainly locks the infant up, safe from meddlesome and unintelligent treatment. I am a little frightened by mechanical devices. They are so impersonal, and there such great temptation to place too much reliance on them. Their use tends to exclude personal responsibility for and individual evaluation of the patient in question. It would seem, in my opinion, more important that physicians and nurses be trained to understand something of the physiological processes in fetal and neonatal life, so that they can have an intelligent approach to the problems involved in asphyxia neonatorum and the kind of treatment indicated in individual cases.

Dr. Robert A. Johnston, Houston, Tex.: Admitting that the first few hours and the first day of life are the most perilous for the newborn, one understands the great interest the obstetrician has in any immediate resuscitative measure, as well as any continued supportive aid for the infant during this hazardous period. It is my opinion that the lock resuscitator, in exerting its positive pressure, fulfils such requirements for the newborn infant. The older methods of resuscitation employed by members of the profession not only have been of questionable success but most likely should be considered harmful. The insertion of a gauzed finger into the mouth and throat to wipe out mucus, thus injuring the mucous membranes; the grasping of the tongue with an Allis clamp and the periodic tugging on same; the uncontrollable pressure of mouth-to-mouth breathing; the frequent immersion of a shocked infant from a warm to a cold tub of water; the stretching of the sphincter ani muscle by inserting an oversized finger into the rectum; the intermittent jackknifing of the infant as well as the forceful compression of the chest of the distressed infant by the hand of a well-meaning attendant; even the spectacular tossing of the infant into the air, as advocated by Schultze—all these measures, judged by present-day knowledge, seem not only questionable but definitely unjustifiable. Any infant withstanding such treatment deserves to survive, although it may have "cauliflower" ears and healed multiple fractures to exhibit to posterity. Looking back over a private obstetrical practice of about thirty years, I am forced to question whether one is justified in doing more than draining the respiratory passages of the infant by gravity, preventing the loss of heat whenever possible, and occasionaly exerting nontraumatizing external sensory stimulation. The careful employment of the infant bronchoscope, especially in cases in which there is the "tapioca" type of amniotic fluid or evidence of an obstructed bronchus, needs no comment. The administration of drugs as a respiratory stimulant is of merit in some cases. With the use of the lock resuscitator, one can dispense, in practically all cases, with the tracheal catheter and its attending danger. To reduce infant mortality, a triple responsibility is shared by the anesthetist, the obstetrician, and the pediatrician. The cooperation of such a team, along with a well-regulated premature nursery, inevitably leads to a reduction in infant mortality. The lock resuscitator invented by Dr. Bloxsom is a boon to the obstetrician, the anesthetist, and the pediatrician. I have witnessed its efficacy repeatedly. The infant can be constantly observed, and at the same time it is protected from being handled or injured by well-meaning but overzealous accoucheurs. The temperature and the amount of oxygen, as well as the humidity, are automatically controlled for the optimum benefit to the infant. Correctly timed intermittent forced pressure takes the place of sensory stimulation. It is astounding to see the amount of fluid that the infant may express from the respiratory tract. I have witnessed its marvelous achievement of resuscitating several infants and its keeping these babies alive thereafter. The change for the worse in some of the premature infants removed only for a short interval from the resuscitator was so marked that no doubt was left concerning its lifesaving value. The resuscitator will perform the impossible. The newborn still needs the alertness, care, and keen judgment of the triumvirate mentioned. I believe statistics in the future will confirm that the lock resuscitator offers the most ideal place for the newborn infant, especially if distressed, to spend the most perilous period of its life.

Dr. Allan P. Bloxsom, Houston, Tex.: The question has been asked whether the fluid comes from the pulmonary tree or from the stomach. The reasons that suggest its coming from the pulmonary tree are (1) that the fluid is frothy, as a rule, and in the form of small bubbles and (2) that the fluid is expelled, for the most part, when the pressure in the lock is being decreased. If the fluid were coming from the stomach, one would expect it to be smooth and to appear when the pressure in the lock is being increased.

Toxemias of Pregnancy.—Two main types of hypertensive pregnancy toxemia are seen. The preeclampsia-eclampsia complex has received considerable attention, but the more permanent arteriosclerotic toxemia very little. Vital statistics indicate that the latter is more important as a cause of maternal death than the former, since there is, even in the absence of further pregnancies, a 20 per cent ten-year mortality and in their presence a 40 per cent rate. It has been estimated that about 40 per cent of the toxemias of pregnancy are of this type.—F. E. Whitacre, M.D., Obstetrics and Gynecology, in Medicine of the Year: Philadelphia, J. B. Lippincott Company, 1951, p. 83.

CLINICAL NOTES

ALKALOSIS DUE TO HYPERVENTILATION

A REPORT OF THREE CASES

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Gilbert H. Marquardt, M.D.
and
George M. Cummins Jr., Chicago

Recently one of us (G. H. M.) reviewed the factors involved in the regulation of acid-base balance and pointed out the necessity of actual determination of the blood pH for correct differentiation of respiratory and metabolic acidosis and alkalosis.[1]

Breathing in excess of the physiological requirements removes excessive quantities of carbon dioxide from the blood and tends to produce alkalosis. Hyperventilation may be severe enough to overcome the compensatory mechanisms, and the pH of the blood then rises above the accepted upper limit of normal (7.45). Symptoms that result include tingling of the fingers and toes, numbness of the face followed by carpopedal spasm and ultimately by generalized spasms, convulsions, delirium and disorientation.

Alkalosis due to hyperventilation may be induced in a number of ways as outlined by Peters,[2] and Cantarow and Trumper[3]: acute hyperventilation, which occurs in unstable persons under sudden emotional stress; fever hyperventilation, which occurs because of increase in body temperature; high external temperature, which, if prolonged, may result in primary carbonic acid deficit; anoxic anoxemia, which occurs as a result of high altitudes and lowered atmospheric oxygen tension, producing the primary carbonic acid deficit; lesions of the basal ganglia, such as encephalitis, which produce hyperventilation over long periods of time.

A review of the literature reveals no clinical reports of hyperventilation alkalosis. Three cases of respiratory alkalosis are presented to illustrate several unusual features and to further emphasize the importance of venous blood pH determinations in the diagnosis and treatment of this disorder.

REPORT OF CASES

CASE 1.—Mrs. E. D., a 31 year old white woman, was admitted to the hospital in December, 1948, with the complaint, of two months' duration, of frequent attacks of shortness of breath associated with dryness of the mouth, a tight feeling, and a sensation of a "lump" in her throat. A constricting feeling in her chest usually followed. Occasional accompaniments were numbness of the upper lip, vertigo, and headache. Inventory of symptoms was noncontributory as was the past history. Physical examination revealed a somewhat obese (180 lb. [81.6 Kg.]) white woman, with blood pressure of 96/66. The pulse, temperature, and respirations were normal. The remainder of the physical findings were essentially normal.

Laboratory studies included the following data: Red blood count was 4,240,000, hemoglobin 94%, and white blood count 9,000. Differential blood count showed no abnormalities. The urine contained no albumin, sugar, or blood cells. Blood chemical studies (expressed in milligrams per 100 cc. except as indicated) showed nonprotein nitrogen 27, glucose 107, calcium 10.5, phosphorous 3.77, albumin 3.98 Gm., globulin 1.90 Gm., and cholesterol 206. Vital capacity was 3,400 cc. (normal 3,760). The electrocardiogram showed no diagnostic deformities. X-ray study of the chest revealed no cardiac or pulmonary pathology. Barium study of the esophagus was normal. Dehydrocholic acid (decholin®) circulation time was 14 seconds, and the venous pressure was 144 mm. of water.

During her hospital stay the patient experienced two minor episodes of dyspnea and tightness of the chest. These were very mild and disappeared gradually without treatment. A laryngoscopic examination during an attack was normal, and physical examination on both occasions was normal except for an increased rate of respiration. When the patient was asked to voluntarily hyperventilate for 10 minutes, a typical attack was reproduced except for the absence of chest distress. The hyperventilation test was then repeated after we had obtained an initial venous blood pH determination, which was 7.35.

After 12 minutes of hyperventilation, the venous blood pH rose to 7.55, and again the typical symptoms of the "attacks," including a constricting sensation of the chest and throat, numbness of the lips, dizziness, and headache, were produced and persisted for two hours, after which the patient again felt perfectly well. At present, 24 months after her discharge from the hospital, this patient continues to have only an occasional, mild, symptomatic episode, which is easily dissipated when she consciously slows her rate of respiration.

CASE 2.—G. S., a 56 year old white woman who was under observation for "anginal" pain syndrome at Wesley Memorial Hospital in March, 1948, was seen one evening because of sudden dyspnea. She complained of shortness of breath, a constricting sensation in her throat, and numbness of the face and both hands. The patient had a respiratory rate of 38 and severe carpopedal spasm. Her symptoms were dramatically relieved by reassurance, calcium gluconate given intravenously, and conscious effort on her part to slow her respiratory rate. The physical examination was essentially normal, and the past history was noncontributory.

The following information was obtained from the laboratory. The urine showed a trace of albumin but no sugar. Red blood count was 4,360,000, hemoglobin 83%, and white blood count 5,100, with a differential count within normal limits. Sedimentation rates were 17 and 20 mm. (normal under 20). Blood chemical studies (in milligrams per 100 cc.) showed nonprotein nitrogen 29.9, cholesterol 206, calcium 9.2, and phosphorous 4.3. Electrocardiograms taken at four day intervals were essentially normal and showed no diagnostic changes. X-ray examination of the chest was considered to be within normal limits.

Two days after the above described attack, a hyperventilation test, as outlined earlier, was carried out. Venous blood pH prior to the test was 7.37, and after only five minutes of active hyperventilation, the typical symptoms of which she originally had complained were reproduced, including dizziness, slight headache, numbness of face, and tingling and numbness of the hands; no carpopedal spasm developed, however. Blood pH was 7.49. These symptoms were identical in onset and character with the attack experienced previously except for the absence of carpopedal spasm. At the present writing, 21 months later, the patient remains free of any distress and has had no symptoms suggesting a recurrent episode.

CASE 3.—Mr. T. R., a 40 year old white man, was under treatment at Wesley Memorial Hospital in February, 1948, for rheumatic heart disease manifested by mitral stenosis and insufficiency, aortic stenosis, auricular fibrillation, and marked decompensation. The patient was receiving routine treatment for decompensation, including low salt diet, digitoxin, aminophylline, oxygen, meralluride injection (solution mercuhydrin® sodium), and morphine. On the sixth hospital day he became irrational; he began to sing and talked constantly and incoherently. He became incontinent, uncooperative, and difficult to restrain. The diagnosis of a drug psychosis was considered, but because of the pronounced increase in the respiratory rate, a hyperventilation

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From the Departments of Medicine, Wesley Memorial Hospital and Northwestern University Medical School.

[1] Marquardt, G. H.: Recent Developments in the Treatment of Acidosis, M. Clin. North America 32:264, 1948.

[2] Peters, J. P.: Water Balance in Health and Disease, in Duncan, G. G.: Diseases of Metabolism: Detailed Methods of Diagnosis and Treatment; A Text for the Practitioner, ed. 2, Philadelphia, W. B. Saunders Company, 1947, p. 316.

[3] Cantarow, A., and Trumper, M.: Clinical Biochemistry, ed. 3, Philadelphia, W. B. Saunders Company, 1945, p. 283.

syndrome was thought more probable. No changes in medications were made. The venous blood pH was 7.62. Ammonium chloride therapy was instituted; 1 Gm. was given orally every four hours. The patient, though showing no change in his cardiac status, began showing some improvement 16 hours later, and 24 hours after ammonium chloride therapy was begun, he was completely rational, coherent, and cooperative. Venous blood pH at this time was 7.45. The patient's cardiac status continued to improve slowly, and no recurrence of alkalosis developed.

Three months after discharge from the hospital, he remained compensated on a limited activity basis, and no further bouts of alkalosis had been experienced.

COMMENT

We feel that respiratory alkalosis is an easily produced and probably often overlooked syndrome. As pointed out by Peters [2] and others, in patients who have a slight, asymptomatic, preexisting alkalosis from other causes such as vomiting or excessive alkaline therapy, only moderate hyperventilation is required to precipitate severe symptoms.

The cases presented represent typical hyperventilation syndrome. The alkalosis in cases 1 and 2 was the result of unconscious hyperpnea in usually stable persons and presented a diagnostic problem in differentiation from cardiac disease. Case 3 illustrates the extremes to which this process may go and the importance of prompt and accurate diagnosis and treatment in an acutely ill patient.

Venous blood pH determinations were made on a standard Coleman pH meter, as previously described by one of us (G. H. M.).[1] A sealed glass electrode chamber is fitted with a sterile 2 inch length of rubber tubing, to the end of which is attached a sterile 1 inch needle. To the aspirating side arm of the chamber are attached another 1 inch length of rubber tubing, a thumb clamp, and a 2 cc. syringe. The pH meter is standardized prior to each determination with a standard buffer solution of pH 7.4. About 2 cc. of sterile water is drawn into the chamber. The patient's arm is cleansed with alcohol, a tourniquet placed above the elbow, and 1 cc. of blood is drawn from a vein into the vertically held chamber. The tubing and needle are removed from the chamber, and the latter is placed immediately in the meter. The pH is read directly. Readings are obtained 10 to 20 seconds after the needle punctures the vein and usually 20 to 40 seconds after the application of the tourniquet.

The practicability of venous blood pH determinations has been previously discussed.[1] Furthermore, the ease and rapidity of the test makes it a most valuable clinical aid in the correct interpretation of acid-base disturbances.

SUMMARY

The practical clinical application of venous blood pH determinations is illustrated by three cases of alkalosis due to primary carbonic acid deficit caused by hyperventilation. The value of venous blood pH determinations in acid-base disturbance is discussed, and the etiology of hyperventilation alkalosis is reviewed.

Pathology.—Pathologists in charge of hospital laboratories should be trained and interested in clinical pathology. The primary fixation on, and interest in, pathologic anatomy by many who call themselves pathologists is probably the greatest sin in pathology today. . . . Clinical pathology in the small and medium-sized hospital is in the hands of technicians, and this is not good medicine.—Trends in Pathology, *American Journal of Clinical Pathology*, May, 1951, pp. 464-467.

CARDIAC ACCIDENTS FOLLOWING VASOPRESSIN INJECTION (PITRESSIN®)

Irvin L. Slotnik, M.D., Milwaukee
and
Joel D. Teigland, M.D., Wood, Wis.

Vasopressin injection (pitressin®) has become widely accepted as a useful aid in roentgen visualization of the gallbladder. Through its ability to increase peristalsis, vasopressin injection results in rapid expulsion of gas from the intestine, thus removing obscuring gas shadows. The drug may cause only transient and minor toxic reactions. Collins and Root [1] recognized three contraindications: coronary heart disease, hypertension and hypotension (systolic blood pressure under 100). Kirklin [2] in reporting on the use of vasopressin injection in 100 cases, noted no serious ill effects although numerous minor reactions were observed, the most frequent being pallor. Recently, Mills and co-workers [3] directed attention to the possibility of serious myocardial effects of the drug. We observed two cardiac accidents following vasopressin injection during cholecystography. On the basis of generally accepted principles governing its use, no contraindication to the use of the drug was evident in these cases.

REPORT OF CASES

CASE 1.—A man, 63, was hospitalized for upper abdominal pain of two weeks' duration, occurring after fatty foods were eaten and accompanied by vomiting. There was no history of heart disease and no symptoms referable to the cardiovascular system, except for shortness of breath on unusual exertion. The blood pressure was 130/80 in both arms, there was no cardiac enlargement, and no thrills or murmurs were detected. Abdominal examination revealed no evidence of disease. The white blood cell count, sedimentation rate and blood reaction to the Kahn test were normal. A chest roentgenogram and teleoroentgenographic heart studies did not reveal heart disease. An electrocardiogram on the day after admission, including the three standard leads, unipolar precordial leads and unipolar limb leads, was normal.

Because of the history of abdominal pain and fatty food intolerance, gallbladder studies were requested. On April 18, 1949 at 8:00 a. m., the patient was given hypodermically 1 cc. of vasopressin injection with a pressor activity equivalent to 20 U. S. P. posterior pituitary units. (The roentgenograms were subsequently reported as revealing a nonfunctioning gallbladder containing stones.) Five hours after the vasopressin injection, he suddenly complained of severe left precordial pain, radiating into the left shoulder. At this time the patient was in acute distress, dyspneic and bathed in cold perspiration. The blood pressure was 120/90 and ten minutes later fell to 100/80. The pulse was rapid but regular, and the heart sounds were somewhat decreased in volume as compared to previous observations.

From the Veterans Hospital, Wood, Wis., and the Marquette University School of Medicine, Milwaukee.

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[1] Collins, E. N., and Root, J. C.: Elimination of Confusing Gas Shadows During Cholecystography by Use of Pitressin, J. A. M. A. **107**: 32 (July 4) 1936.

[2] Kirklin, B. R., and Seedorf, E. E.: Clinical Study of Reactions Following Employment of Pitressin in Cholecystography, Am. J. Roentgenol. **42**: 811-819, 1939.

[3] Mills, M. D.; Burchell, H. B.; Parker, R., and Kirklin, B. R.: Myocardial Infarction and Sudden Death Following Administration of Pitressin: Additional Electrocardiographic Study of 100 Patients Given Pitressin for Cholecystography, Proc. Staff Meet., Mayo Clin. **24**: 254, 1949.

There were no abnormal abdominal findings. Clinically, the patient appeared to have had an acute coronary thrombosis.

An electrocardiogram taken that day revealed changes compatible with myocardial infarction. Serial electrocardiographic tracings subsequently showed progressive changes typical of anteroseptal myocardial infarction. The sedimentation rate (Westergren) rose to a peak of 80 and then gradually fell to normal over a period of four weeks, paralleling his clinical course. On the therapeutic regimen for coronary thrombosis, the patient made an uneventful recovery.

Case 2.—A man aged 54 was admitted with a history of recurrent epigastric distress of 12 years' duration, relieved by ingestion of food and antacids. He complained, in addition, of occasional nausea and vomiting. Physical examination and a chest roentgenogram revealed no evidence of pulmonary disease. The heart was not enlarged to percussion, the rhythm was regular, and the rate was 88. Thrills or murmurs were not detected, and the blood pressure was 140/88. Tenderness was noted in the left epigastrium, but no other abdominal abnormalities were present.

On a Sippy regimen, antacids and antispasmodics, the symptoms subsided within 48 hours. A gallbladder series was reported as unsatisfactory due to overlying gas in the bowel. For this reason 1 cc. of vasopressin injection was given hypodermically to rid the bowel of gas and the cholecystogram was repeated. Four hours after receiving the drug the patient complained of moderate shortness of breath followed by nausea and vomiting. The dyspnea suddenly increased, and he became exceedingly apprehensive, clutching at his chest as though in severe pain. He was cold, pale and clammy. His blood pressure was 60/40, the pulse was rapid and regular, and the heart sounds were faint and distant. There were no abnormal abdominal observations. In spite of emergency treatment the patient died within 30 minutes.

At autopsy the heart revealed an old posterior wall myocardial infarction and some concentric hypertrophy of the left ventricle. Healed rheumatic mitral disease without stenosis was present. The coronary vessels showed atheromatous changes with narrowing but no obstruction of the lumens. Some pulmonary congestion with hemosiderosis of the lung was observed. The gallbladder was free of disease.

Death in this case can be attributed to acute coronary insufficiency induced by vasopressin injection. Myocardial ischemia, when prolonged, will lead to myocardial infarction. No actual vascular occlusion is required for infarction to occur; in fact, myocardial infarction without occlusion is by no means unusual. Such prolonged ischemia is a characteristic effect of vasopressin injection, and its results are most damaging when underlying coronary disease is present, as was the case in our second patient.

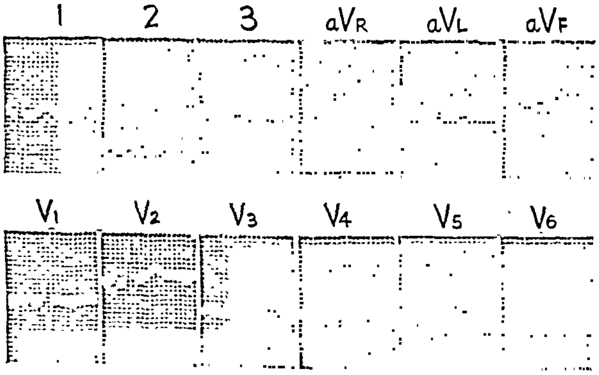

Fig. 1 (case 1).—Electrocardiogram with unipolar limb leads and precordial V leads taken one week before the administration of vasopressin injection.

The absence of myocardial infarction at postmortem examination is as expected, since patients who die after coronary occlusion do not show the usual pathological changes unless they survive six to 12 hours. This length of time is required for the development of necrosis.[4]

COMMENT

That vasopressin injection could be responsible for cardiac accidents is not surprising in view of the experimental work which has been done. Posterior pituitary extract has been shown to have a definite effect not only on the blood vessels and blood pressure but on the heart itself. As early as 1895 the ability of this drug to produce capillary and arteriolar constriction was demonstrated. It was first believed that this vascular constriction was associated with a rise in blood pressure similar to that seen with epinephrine.[5] Later, however, it was shown in the unanesthetized animal and in human subjects that a rise in blood pressure does not occur in spite of capillary constriction. A drop in blood pressure is, in fact, much more characteristic.[6]

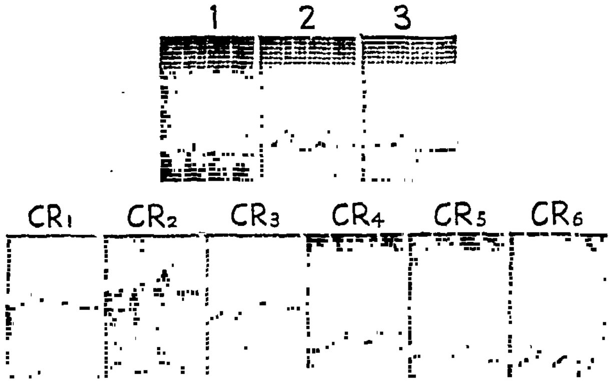

Fig. 2 (case 1).—Electrocardiogram with precordial CR leads taken seven hours after the administration of vasopressin injection.

It has also been demonstrated that pituitary extract results in a slowing of the pulse, associated with sinoauricular block and auriculoventricular block. This response cannot be prevented by administration of atropine or section of the vagi, thus illustrating a direct cardiac effect.[7]

Kamm and associates [8] succeeded in separating pituitary extract into its oxytocic factor and its vasopressor and antidiuretic principle. The vasopressor principle is now known as vasopressin injection (pitressin®), while the oxytocic factor is called oxytocin injection (pitocin®). Experimental work in man utilizing vasopressin injection has revealed essentially the same effects as shown with the crude extract in animals. That a rise in blood pressure does not occur in man was demonstrated by Grollman and Geiling,[6b] who also noted a decrease in heart rate and cardiac output. Collins and Root [1] noted an occasional slight but transient rise in blood pressure. In none of their cases, however, was the blood pressure as high at the end of one hour as it had been before vasopressin injection was given.

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[4] Anderson, W. A. D.: Pathology, St. Louis, C. V. Mosby Company, 1948.

[5] Oliver, G., and Schaefer, E. A.: On the Physiological Action of Extracts of Pituitary Body and Certain Other Glandular Organs, J. Physiol. 18: 277-279, 1895.

[6] (a) Kolls, A. C., and Geiling, E. M. K.: Pharmacology of Extracts of Posterior Lobe of Pituitary Gland, J. Pharmacol. & Exper. Therap. 24: 67-81, 1924. (b) Grollman, A., and Geiling, E. M. K.: Cardiovascular and Metabolic Reactions of Man to Intramuscular Injection of Posterior Pituitary Liquid (Pituitrin), Pitressin and Pitocin, ibid. 46: 447-460, 1932.

[7] Resnik, W. H., and Geiling, E. M. K.: Action of Pituitary Extract on Heart of Unanesthetized Dog, J. Clin. Investigation 1: 217-238, 1924-1925. Gruber, C. M., and Kountz, W. B.: Observations on Effect of Pitressin on Blood Pressure, Pulse Rate and Respiration in Dogs, J. Pharmacol. & Exper. Therap. 39: 275-299, 1930.

[8] Kamm, O.; Aldrich, T. B.; Grote, I. W.; Rowe, L. W., and Bugbee, E. P.: The Active Principles of the Posterior Lobe of the Pituitary Gland: I. The Demonstration of the Presence of Two Active Principles: II. The Separation of the Two Principles and Their Concentration in the Form of Potent Solid Preparations, J. Am. Chem. Soc. 50: 573-601, 1928.

Probably the most significant effect of vasopressin injection is its effect on the coronary circulation.[9] Numerous investigations have confirmed that the coronary blood flow is decreased with persistence of this effect for as long as 45 minutes. Green was able to demonstrate intense coronary constriction with depression of the myocardial contractility.[10] In 1944 Dearing, Barnes and Essex [11] showed that acute myocardial degeneration could be produced in cats by administration of large doses of vasopressin injection. That this effect could be produced only in the old animals is particularly interesting in view of the fact that the cardiac accidents which we observed both occurred in older patients. Ruskin [12] actually utilized this deleterious effect of vasopressin injection on the coronary circulation as a test of coronary insufficiency. He demonstrated resulting bradycardia, premature beats, and S-T and T wave changes.

A significant and peculiar characteristic of vasopressin injection is the long duration of myocardial ischemia which it can produce and its unusually long latent period. This is well illustrated by our two cases, in which four and five hours passed before the cardiac effects became evident. Similar observations were made by Mills in his four cases in which latent periods of 4 hours, 2 hours, 1½ hours and 20 minutes were noted prior to onset of cardiac symptoms. The prolonged ischemia is probably an important factor in the serious reactions which have been recorded, since it is well known that prolonged hypoxia, even of mild degree, can result in myocardial infarction.

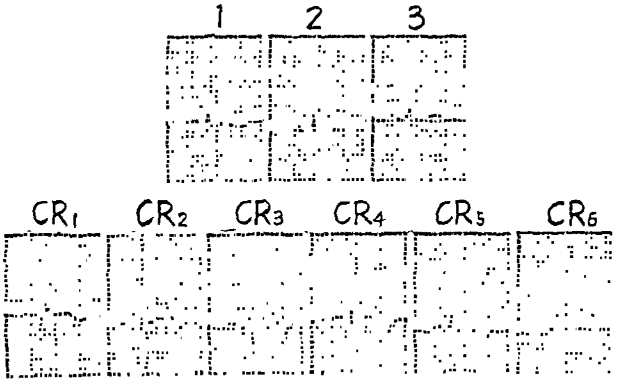

Fig. 3 (case 1).—Electrocardiogram with precordial CR leads taken three weeks after the administration of vasopressin injection.

Vasopressin injection is capable of serious and even fatal cardiac accidents in elderly patients. This is conclusively demonstrated by our cases and those of Mills. Whether it can produce such effects in the normal young heart is, however, by no means determined. Neither in our cases nor in those of Mills has underlying coronary heart disease been eliminated as a factor. In our one case with autopsy and in the two of Mill's cases with postmortem examination, old myocardial infarcts were found. In addition, all these cases are in the age group between 54 and 65, which suggests that coronary arteriosclerosis may have been a factor. A normal electrocardiogram such as we noted in our first case prior to the administration of vasopressin injection, and which was also noted in two of Mill's cases, does not rule out the possibility of underlying coronary heart disease. The frequent observance of normal electrocardiographic tracings even in persons with advanced coronary insufficiency is well recognized.

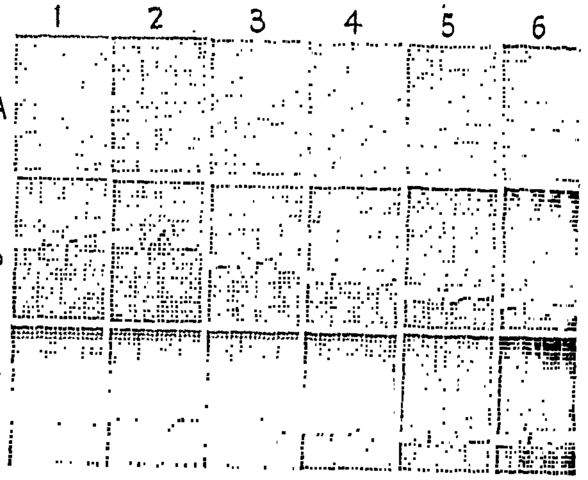

Fig. 4 (case 1).—*A*, precordial V leads taken one week prior to the administration of vasopressin injection; *B*, precordial CR leads taken three weeks after the administration of the drug, and *C*, precordial CR leads taken seven hours after its administration.

Certainly there is general agreement that vasopressin injection should be withheld in the presence of coronary insufficiency. It appears that a routine electrocardiogram before the utilization of vasopressin injection would be a wise procedure. Though an abnormal tracing contraindicates use of the drug, a normal electrocardiogram does not assure one that it can be given with impunity.

Perhaps it would be best to withhold vasopressin injection entirely in older persons. Great care must be taken to differentiate the symptoms of gallbladder disease from those of coronary insufficiency when the use of vasopressin injection is contemplated. That the symptoms of gallbladder disease can be mimicked by coronary insufficiency induced by a large meal is well known. Despite the fact that gall stones were found in our first patient, it is quite possible that his symptoms were actually those of coronary insufficiency.

SUMMARY

Vasopressin injection (pitressin®) has proved to be useful for the elimination of confusing gas shadows during cholecystography. It has been generally accepted as a safe medicament. Extensive experimental work in the past has demonstrated profound cardiovascular effects resulting from its use, the most important being a decrease in coronary blood flow. An instance of proved myocardial infarction and a death following the administration of vasopressin injection are reported. It is suggested that the drug be used with caution, if at all, in elderly patients.

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[9] Essex, H. E.; Wegria, R. G. E.; Herrick, J. F., and Mann, F. C.: The Effects of Certain Drugs on the Coronary Blood Flow of the Trained Dog, Am. Heart J. **19**: 554-565, 1940.

[10] Green, H. D.; Wegria, R., and Boyer, N. H.: Effects of Epinephrine and Pitressin on Coronary Artery Inflow in Anesthetized Dogs, J. Pharmacol. & Exper. Therap. **76**: 378, 1942.

[11] Dearing, W. H.; Barnes, A. R., and Essex, H. E.: Experiments with Calculated Therapeutic and Toxic Doses of Digitalis; Comparative Effects of Toxic Doses of Digitalis and Pitressin on Electrocardiogram, Heart and Brain, Am. Heart J. **27**: 108, 1944.

[12] Ruskin, A.: Pitressin Test of Coronary Insufficiency, Am. Heart J. **34**: 569-579, 1947.

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COMPLETE OBSTRUCTION OF THE ESOPHAGUS FOLLOWING SERUTAN® INGESTION

C. L. Hinkel, M.D., Dunville, Pa.

In the course of hospital practice of radiology it is not uncommon to find obstruction of the esophagus in patients who have symptoms of brief duration. The commonest non-neoplastic obstruction is that resulting from impaction of meat or some other foreign body. The finding of obstruction of the lower end of the esophagus following the ingestion of the proprietary preparation known as serutan® is unique in our experience. In 1937 and also in 1939 saraka® (a hygroscopic gum laxative) was reported as causing esophageal obstruction.[1] Since that time we have seen no reports of such cases in the literature.

Serutan,® a bland granular hygroscopic substance, which is widely used as a remedy for constipation, is said by the manufacturers to be a hydrogel derived from Plantago ovata and extracted sugar beets from which the roughage has been removed. Apparently, serutan® owes its laxative properties to its gelatinous, spongy character and its ability to absorb and retain liquids, with a corresponding increase in bulk.

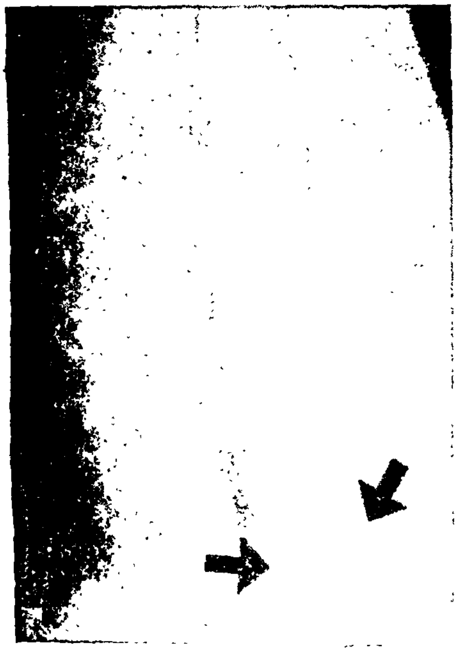

Fig. 1.—Roentgenogram of barium in the esophagus, right anterior oblique projection. The obstruction is complete. Note inverted meniscus sign at the site of impaction, dilatation of the proximal esophagus and a slight spillage of the barium into the trachea.

Because of the rarity of this type of esophageal obstruction, the following case is reported in brief.

REPORT OF CASE

H. B., a 75 year old white man, was referred to this hospital by his family physician on March 3, 1950, complaining of pain in the chest, a feeling of "bursting" behind the sternum and inability to swallow.

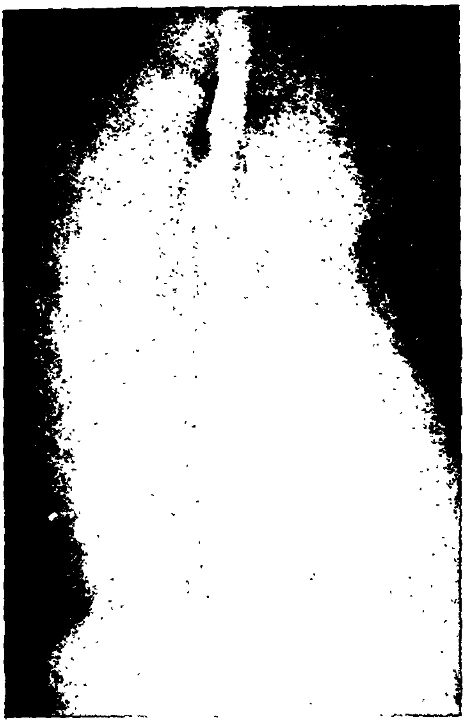

Fig. 2.—Postoperative roentgenogram of barium in the esophagus, right anterior oblique projection. The obstruction has been removed. The esophagus appears normal.

The patient stated that he was troubled with constipation and that on March 11 he took two doses of serutan® without untoward symptoms. He took two doses in the same manner on the following two days, March 12 and 13. On March 14 he swallowed the serutan® in the following manner: Two teaspoonfuls of dry serutan® was placed in a cup and 1 teaspoonful was swallowed and washed down with a few sips of water. The second teaspoonful was then taken and washed down with the remainder of a glass of water.

Within five minutes after ingestion of the laxative the patient had a feeling of oppression and felt that his "gullet" was filling up. He expectorated a great deal of mucoid and salivary material which he estimated to be about 1 pint (473 ml.). Pain developed in the epigastric and retrosternal regions and continued and increased in severity until the time of his admission. After the development of these symptoms he was unable to swallow anything. The patient went to bed but had so much pain and salivation that he was unable to sleep. His physician gave him tablets, which he chewed and swallowed. This caused him to gag, bringing up a considerable quantity of liquid mucoid material, the fragments of the tablets and a chunk of sticky, tough material that he estimated to be 1½ or 2 inches long (3.8 or 5 cm.), resembling a piece of sausage. The patient stated that this looked like some of the serutan® which he had taken. The symptoms of obstruction persisted all night in spite of a morphine injection, and the next morning he was admitted to the hospital.

From the Department of Radiology, George F. Geisinger Memorial Hospital and Clinic.

[1] Goldman, J. L.: Esophageal Obstruction from Hygroscopic Gum Laxative (Saraka), J. A. M. A. **108**: 1408 (April 24) 1937. Waltz, M. R.: Esophageal Obstruction Resulting from Injudicious Method of Ingesting Hygroscopic Gum Laxative (Saraka): Esophagoscopic Removal, ibid. **112**: 229 (Jan. 21) 1939.

Physical examination was noncontributory except for evidence of arteriosclerosis. The diagnosis of obstruction was made at once, and the patient was given papain suspension, which was regurgitated promptly. Urinalysis of a specimen secured on admission and all laboratory tests revealed no abnormality except for a white blood cell count of 18,200, of which 86 per cent were polymorphonuclear cells.

Roentgenological Examination.—Under fluoroscopic control the patient was given a drink of barium sulfate suspension. There was complete obstruction in the lower third of the esophagus, and no barium entered the stomach. The inferior end of the barium column in the esophagus outlined a smoothly rounded mass, and in the erect position some of the barium tended to surround the mass, producing the typical inverted meniscus sign frequently associated with meat impaction. The esophagus was somewhat dilated proximal to the obstruction, and some of the barium spilled over into the trachea, producing a paroxysm of coughing (fig. 1).

Esophagoscopy.—On March 15, 1950, a 9 mm. by 53 cm. full lumen esophagoscope was introduced without difficulty. The esophagus contained a large amount of saliva and some barium. After this was aspirated the mucosa was found to be edematous and congested. Three inches (7.6 cm.) above the diaphragm the lumen was completely obstructed by pasty, granular, brown material that looked somewhat like brown sugar. It was sticky and cohesive and was removed with great difficult as the aspirator frequently became clogged. Some of the material was removed with forceps. The mucosa in the area of the obstruction was noted to be extremely dry, granular and inflamed.

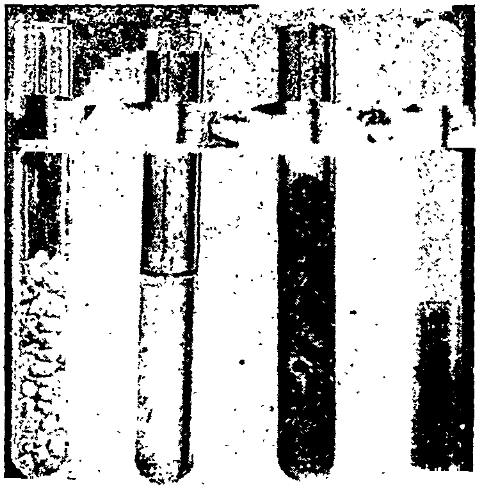

Fig. 3.—Simple test tube demonstration: tube 1, dry serutan®; tube 2, water; tube 3, water and serutan,® mixed; tube 4, water and serutan mixture inverted without spilling.

After the removal of all of the material, a no. 20 bougie was passed into the stomach without further obstruction.

Hospital Course.—The patient was given dihydrostreptomycin, 0.7 Gm. intravenously twice a day, and also fortified crystalline procaine penicillin G (duracillin®) 400,000 units every six hours, in order to combat the local esophagitis.

After the removal of the impaction, the symptoms disappeared. The patient was able to swallow, and reexamination of the esophagus, stomach and duodenum by roentgenoscopic and roentgenographic means disclosed no abnormal findings in the esophagus or stomach. The normal postoperative roentgenogram is reproduced in figure 2.

FURTHER INVESTIGATIONS

Because of the unusual interest of this case, a supply of serutan® was secured from a local drug store, and the hygroscopic nature and interesting physical properties of the substance were investigated. It was found that when water was added to the dry serutan,® the granular material quickly became wet, swollen and spongy. If insufficient water was added, a semisolid gel was formed which on standing became firmer and firmer. When equal quantities of serutan® and water were mixed together in a test tube, the mixture stiffened so quickly that in 30 seconds it was possible to invert the tube without spilling the contents.

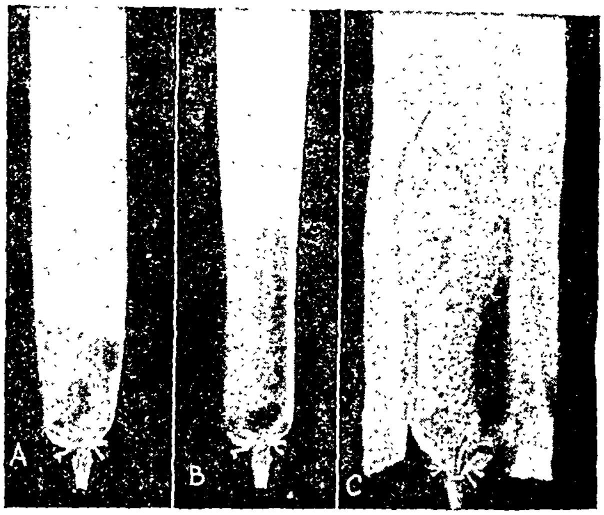

Fig. 4.—*A*, dry serutan® in a 1 inch (2.5 cm.) rubber Penrose drain. *B*, water added to serutan® in the rubber drain. Material is swollen, spongy and granular but firm to palpation 30 seconds later. *C*, rubber drain cut open, exposing the wet, gelatinous, cohesive serutan® that retains the form of the tube.

A simulated esophagus was made by tying off a piece of rubber Penrose surgical drain 1 inch (2.5 cm.) in diameter. When serutan® and water were mixed in this drain, it was found that considerable swelling took place and that within 30 seconds the mixture became quite firm to palpation. Within two minutes an impaction had formed which was so firm that when the rubber tubing was cut open, the sausage-like mass could be held easily in the fingers (fig. 4 and 5).

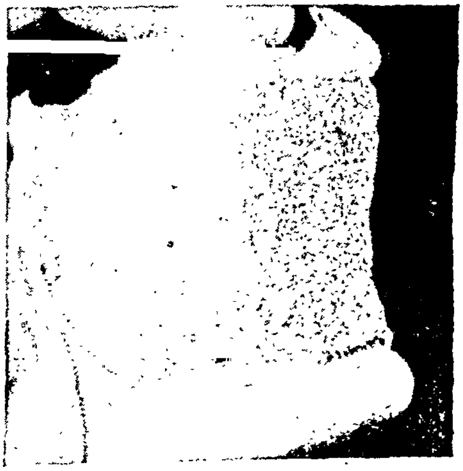

Fig. 5.—Two minutes after addition of water the serutan® can be held in the fingers much like a piece of sausage.

COMMENT

From the results of the simple experiments described above, the patient's history and the absence of demonstrable esophageal disease we formed the opinion that the unusual obstruction of the lower end of the esophagus in this patient was the result of the rapid swelling of the;

serutan® during its passage through the esophagus. It is likely, of course, that there was some delay in the esophagus as the result of temporary cardiospasm or other transient constriction. No organic disease of the esophagus was found that might explain the delay which presumably occurred. Probably the patient swallowed an insufficient amount of water with the dry serutan,® and the limited amount of water favored the production of a semisolid mass which obstructed the lumen; hence when the remainder of the glass of water was ingested, the impaction was already present. The local esophagitis noted at the time of esophagoscopy was presumably the result of local dehydration of the mucosa, together with continued swelling of the serutan® mass, producing stretching of the esophageal walls. It would seem wise to advise patients who use the substance, or other similar hygroscopic substances, to observe the precaution of ingesting copious amounts of water or other liquids that will quickly wash it into the stomach before impaction can occur in the lower esophagus.

SUMMARY

An unusual case of esophageal obstruction is reported. This presumably resulted from the ingestion of dry serutan® followed by an insufficient fluid intake. The typical roentgenological characteristics of such an impaction are presented.

COUNCIL ON PHARMACY AND CHEMISTRY

The Council on Pharmacy and Chemistry has authorized publication of the following report to the Council.

R. T. Stormont, M.D., *Secretary.*

RADIOACTIVE ISOTOPES IN MEDICAL RESEARCH, DIAGNOSIS, AND THERAPY

F. E. Kelsey, Ph.D., Chicago

Since the Isotopes Division of the Oak Ridge National Laboratory began the distribution of isotopes for research and therapy in 1946, over 10,000 shipments have been made, more than 40% of which were for medical research, diagnosis and therapy.[1] A large number of radioactive isotopes have been synthesized both by neutron bombardment in a nuclear-reacting pile and by cyclotron. Extensive biologic or medical applications have been made with phosphorus 32, iodine 131, sodium 24 and carbon 14.[2] Radioactive isotopes are generally available in an elemental state or as simple ionic compounds, although the number of radioactive organic compounds that have been synthesized is increasing rapidly.

A radioactive isotope differs from one which is not radioactive only in the composition of the atomic nucleus, generally because of an extra neutron. In most biologic reactions, this additional neutron does not affect the chemical properties of the atom sufficiently to enable living organisms to differentiate the isotope from its natural counterpart. Minor differences in reactivity may be demonstrated; for example, the heavier atom diffuses more slowly, but it still can be used as a tracer in metabolic studies.

The changes in the nucleus cause instability of the atom, and disintegration may occur suddenly. This lack of stability, characteristic of all radioactive isotopes, varies extremely from one isotope to another. The time required for disintegration may be a fraction of a second or several million years. Since stability of the nucleus cannot be increased or decreased by any external factors, the time required for disintegration of half of the atoms in any given amount of material containing isotopes is a direct function of the nuclear stability of each radioactive isotope. This property is referred to as the "half-life" of the isotope (see table). Isotopes with a relatively short half-life are safer for clinical use, since the dose of radiation is limited regardless of the persistence of the element in the body. Radioactive sodium, for example, with a half-life of 14.8 hours, can be given in doses of 40 mc. In 14.8 hours, the amount remaining undecomposed is 20 mc.; in 29.6 hours, 10 mc.; in 44.4 hours, 5 mc.; and, in 3.7 days (6 half-lives) only 0.625 mc. remains.[*] On the other hand, an isotope with a longer half-life can be stored over a longer period of time without appreciable loss of activity.

The biologic effect of an internally administered isotope depends on the nature and intensity of the radiations, the half-life of the isotope, its persistence in the body, and its distribution pattern in the body. For example, the high degree of persistence and the selective localization of radium in the bones result in important biologic effects with doses of radioactivity hundreds of times less than that required with isotopes, such as sodium 24 or phosphorus 32, which are more evenly distributed throughout the body. Furthermore, large doses of any radioactive isotope must be administered slowly, or in high dilution, to prevent local damage at the site of administration. Similarly, some isotopes such as iodine 131 and phosphorus 32, are excreted rapidly and may damage the kidney and bladder.

When a radioactive atom disintegrates, the molecule carrying it is shattered and emanations of the beta, gamma or, less frequently, alpha and neutron types, are emitted from the nucleus. The biologic effects resulting from this disintegration are caused largely by these emanations rather than by the destruction of the molecule.

Alpha particles are heavy, doubly-charged particles composed of two neutrons and two protons and are identical with the nucleus of the helium atom. They produce intense, but localized, damage since they collide with other atoms in the immediate vicinity (within 0.05 mm.) more frequently than do the lower-charged and smaller beta particles.

Beta particles are high-speed electrons having a penetrating power up to 8 mm. (for phosphorus 32) in tissue, but their effects are primarily restricted to the immediate vicinity of the disintegration.

Gamma rays are similar to x-rays and penetrate many centimeters, influencing the intermediate tissues.

Neutrons, because they lack an electrical charge, also penetrate deeply but produce local effects from initial collision anywhere along the track.

The speed acquired by the emanations alters their penetration of tissue. High-energy (fast) neutrons are less subject to collision or capture than low-energy (slow) neutrons. Extremely high-energy beta particles produced by a betatron also have a longer range in tissue. Their high speed permits them to penetrate relatively deep before any appreciable ionization is produced. Since this depth is determined by the original energy of the electron, the betatron can be used to produce intense ionization at predetermined depths, as in the treatment of a deep-seated cancer.[3]

HEALTH HAZARDS AND CONTROL MEASURES

The hazards involved in the use of radioactive isotopes are difficult to evaluate since there are no detectable biologic effects which can be used to discover incipient injury. Since the incidence of leukemia and allied diseases is ten times greater among radiologists than among other physicians, it is evident that the blood-forming organs are sensitive to radiations. Measurement of peripheral blood changes is the best control measure available, but these changes vary among persons and daily in the same person. The methods for measuring the hematologic constituents lack precision also.[4] Routine x-rays of workers who may

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Because of lack of space, the bibliographic references have been omitted from The Journal. They are, however, included in the author's reprints.

[*] The most commonly used unit of measure for radioactive isotopes is the millicurie (mc.) which is defined as the amount of isotope giving 2.2×10^9 disintegrations per minute. It is roughly equivalent to the number of disintegrations occurring in one milligram of radium.

be exposed to radiation should be taken as seldom as possible because of the additive effect.

The intensity of radiation in an exposure area must be measured to determine the maximum time a person may receive a "permissible" amount of radiation. The permissible limits have been determined on the basis of past experience with roentgen rays and radioactive isotopes occurring naturally (such as radium) as well as from work with animals. This determination is often only an estimate, since the life span of experimental animals is too short to predict the effect on a human being exposed for many years.[5]

The greatest health hazard involved is the accidental ingestion of radioactive isotopes orally or by inhalations of vapors or dusts. Appreciation of the distances over which the various types of emanations are effective is important. Consideration should be given to reflections and secondary radiation.[6] The total body radiation from cosmic rays received by an individual during a 70 year lifetime is 20 to 40 r. Internally deposited, naturally-occurring radioactive isotopes add another 2 to 5 r to this amount. A chest x-ray results in an exposure of 0.4 to 2 r, and a complete gastrointestinal series may amount to as much as 40 to 75 r. Therapeutic application of roentgen rays to limited areas, as in the treatment of skin carcinomas, may be equivalent to 5,000 r or more. The fatal dose of total body irradiation in human beings has been estimated at 400 r. For rats the fatal dose is 825 to 900 r, for guinea pigs 250 r, and for paramecia 300,000 r.

Radioactive Isotopes

			Penetrability of Radiation (Cm.)		
			Beta Radiation		Gamma Radiation
Element	Atomic Weight	Half-Life	Maximum Range in Air	Maximum Range in Tissue	50% Absorption in Tissue*
Hydrogen	3	12.1 y	0.1	0.0002	..
Carbon	14	5600 y	20.0	0.027	..
Sodium	24	14.8 hr	18.0	0.024	17
Phosphorus	32	14.3 d	600.0	0.8	..
Sulfur	35	87.1 d	25.0	0.032	..
Chlorine	36	1,000,000 y	190.0	0.24	..
Calcium	45	180.0 d	46.0	0.060	..
Iron	59	46.3 d	100.0	0.13	10
Iodine	131	8.0 d	180.0	0.23	9
Gold	198	2.7 d	340.0	0.44	8

* *Where no figures appear, there is no gamma emission.*

Government regulations concerning the use of radioactive isotopes produced by the Atomic Energy Commission are relatively strict and formalized.[7] The Oak Ridge National Laboratory, through its Isotopes Division, is responsible for evaluating and approving an organization's facilities and the qualifications of the physicians and research workers desiring to use radioactive isotopes in human experiments. Approved medical organizations (hospitals, clinics, research organizations) must possess adequate facilities for assaying, handling, and disposing of the radioactive materials as well as for the clinical care of the patient. The physician in charge of the radioactive material must have had previous experience in this field, or be directly collaborating with someone who has such experience, and must be in good standing with the local medical society. The Atomic Energy Commission also recommends that the institution appoint an "isotope committee" to approve all proposals for the use of radioactive isotopes in that institution. This committee should consist of a physician trained in internal medicine, a hematologist, an individual experienced in the handling and use of radioactive isotopes who is familiar with the necessary precautions as to shielding and disposal, and a physicist and therapeutic radiologist, at least available as consultants. Further, special permission is required for the use of isotopes having a half-life of more than 30 days, because of their greater potential hazard.

ANALYSIS FOR RADIOACTIVE ISOTOPES

A characteristic property of the emissions from radioactive decay is their ability to produce ionization by collision with other atoms, resulting in the formation of free electrons. These free electrons are easily and rapidly measurable by such instruments as the Geiger counter, the scintillation counter, and the ionization chamber. The Geiger counter, the most versatile and flexible radiation detector, consists of two electrodes, the cathode being a hollow tube and the anode a fine wire suspended along the longitudinal axis of the tube. When an ionizing particle enters the tube, a few free electrons are formed and accelerated toward the center wire. When their speed is great enough, additional electrons are formed by collision with the gaseous atoms, and these are also accelerated toward the center wire. This multiplication process is referred to as an "avalanche" and results in an electric pulse produced when these thousands of electrons arrive at the center wire. The whole process is initiated by the original ionizing event, i. e., the radiation produced by the disintegrating atom. The apparatus thus records this disintegration. Geiger tubes have been designed in a number of shapes and sizes for specific uses. For example, detection of phosphorus 32 in intracranial tumors required the development of a Geiger tube that could be sterilized and used by the surgeon as a probe to pinpoint the source of radiation in the brain.[8]

In addition to the Geiger tube itself, a power supply and scaling circuit is needed. The latter is a rapid electronic recording device which actuates a mechanical recorder after a given number (usually 64) of ionizing events have been received. Integrating circuits are also used to show the counting rate directly, either on a meter or on a continuous recording device.

The use of the scintillation counter to replace the Geiger tube is a recent development. When this apparatus is employed, the radiation is absorbed in a crystal, resulting in a minute flash of light which is detected by a photomultiplier tube and amplifier. It is more efficient than the conventional Geiger counter for measuring gamma-ray emission.[9]

Ionization chambers which do not have internal-multiplying characteristics like the Geiger tube can be used for most work. These fundamentally simple devices use external amplification to measure the rate of fall of an impressed charge between two electrodes, a function of the radiation entering the chamber.

RADIOACTIVE PHOSPHORUS

Phosphorus 32 is a strong beta emitter with a half-life of 14.3 days. It is available as a solution of sodium phosphate with or without a small amount of nonradioactive sodium phosphate added as a carrier. Concentrations as high as 3 mc. per milliliter are obtainable. For each millicurie of radioactive phosphorus administered, the resultant total body irradiation is 10 roentgen-equivalents, which takes into account the half-life and the excretion of part of the dose. It can be given in single doses up to 7 mc. either intravenously or, in smaller doses, by mouth. About 75% of an oral dose is absorbed, the remainder being lost in the feces, and 20 to 40% of each dose is excreted quickly through the kidney. The rest is distributed unevenly throughout the tissues of the body. High concentrations are found in bone and bone marrow and in the liver, spleen, and lymph nodes. The concentration attained in neoplastic tissue may be two to five times that attained in the corresponding normal tissue. This degree of concentration is not sufficient to permit the use of doses adequate for effective irradiation of neoplasms but can be used with Geiger tube probes as a diagnostic aid.[8] The high concentration in bone and bone marrow permits the successful use of this isotope in polycythemia rubra vera. Single doses may result in remissions lasting 6 to 12 months.[10] Isotopic treatment of leukemia is not as successful, although some benefit may be derived,[11] and it is possible that leukemia may result from large doses of phosphorus 32.

The short effective range of the beta radiation of phosphorus 32 and the absence of gamma radiation makes possible the use of this isotope for local irradiation of the skin in conditions such as radio sensitive skin cancers, hyperkeratosis, verrucae, and hemangiomas.[12] Radioactive phosphorus has been used also to measure the effective circulation in an extremity [13] and to label red blood cells to determine red cell volume.[14]

RADIOACTIVE IODINE

Iodine 131 emits both beta and gamma radiation and has a half-life of eight days. The beta emission is responsible for the inhibitory effect on the tissues, while the gamma emission permits a quantitative evaluation of the site of deposition of the isotope within the body. For this purpose a Geiger or scintillation counter is employed externally. Radioactive iodine is available as carrier-free sodium iodide in weak basic sodium sulfate solution containing up to 5 mc. per ml. It is given by mouth in doses of about 1 to 10 mc. and is rapidly absorbed from the gastrointestinal tract and distributed throughout the body. The percentage of retention of radioactive iodine depends on how much iodine pre-exists in the body and to what degree the thyroid gland is active. In normal persons, the thyroid gland will fix 10 to 25% of the dose, and the remainder will be excreted in the urine within 24 hours. In patients with hyperthyroidism, about 50 to 80% of the total dose may be fixed by the thyroid. In myxedematous patients fixation is 10% or less.

Radioactive iodine is used as a diagnostic aid to detect abnormal thyroid function. Various investigators consider this form of iodine particularly valuable for treating toxic goiter.[15] Its use for treating primary carcinoma of the thyroid has not been universally successful since, as a general rule, only low grade tumors, which usually can be cured by surgery alone, take up significant amounts of iodine 131.[16] However, radioactive iodine is of definite value in locating the site of thyroid cancer metastases.[17] Generally, the metastases concentrate iodine in considerably less amounts than does the normal thyroid gland; however, the uptake can be greatly increased by removing the thyroid surgically, by administering thyrotoxic drugs such as propylthiouracil, or by repeatedly administering iodine 131, which destroys the normal thyroid tissue. These procedures are effective probably because they increase secretion of the thyrotrophic hormone of the anterior pituitary and so stimulate the thyroid metastases that their ability to concentrate iodine is increased.[17a] Surgical removal of the normal thyroid is probably the most satisfactory procedure to stimulate the metastatic tissues to concentrate iodine.

The most serious side-effect observed in patients subjected to treatment with large doses of radioactive iodine is a depression of hematopoiesis. In some cases, the urinary bladder may be sufficiently irradiated to cause transient irritation.

RADIOACTIVE SODIUM

Sodium 24 emits both beta and gamma rays and has a half-life of only 14.8 hours. This makes prolonged storage of the isotope impossible, and therefore its use is restricted to centers close to a nuclear pile or a cyclotron. Radioactive sodium spreads rapidly throughout the tissues and fluids of the body, and, because of the gamma emission, can be detected by externally placed counters. The even distribution of sodium has prompted its use in patients with extensive metastases, although it appears to have no particular advantage over x-ray therapy, or as a substitute for total body x-ray in the treatment of such conditions as leukemia and polycythemia rubra vera.

Radioactive sodium has been most useful in the field of diagnosis. When injected intravenously, its course through the heart may be followed by an externally placed, and appropriately shielded, continuous recording counter. Characteristic curves for normal or abnormal cardiac dynamics may be obtained in this manner.[18] Sodium 24 also can be used to measure the extracellular fluid, since sodium is predominantly an extracellular ion. A measured dose of sodium 24 is given intravenously and a sample of plasma is taken later so that the dilution which has occurred with the sodium previously present can be measured. Circulation time can be measured in similar fashion.[19] Further, the time required to attain a constant level of radioactivity in a limb after administration of intravenous sodium 24 indicates whether circulation to that limb has been impaired. Thus, in thromboangiitis obliterans and arteriosclerotic occlusive disease, the uptake in the affected area is much slower. This delineates the area of impaired circulation and helps determine the best amputation site.[20] This isotope has also been used to estimate the efficiency of medical management of impaired peripheral circulation.[21]

RADIOACTIVE CARBON

Carbon 14 is a weak beta emitter with a half-life of 5,600 years. The long half-life of this carbon isotope makes long-term experiments practical; also, important organic compounds containing it may be stocked. On the other hand, the long half-life adds to the hazards of this isotope, since, once fixed in the body, it will continue to irradiate that part until it is excreted. The use of carbon 14 in human subjects therefore must be preceded by exhaustive experiments in animals in order to be certain that neither the isotopic compound itself, nor any isotope-containing metabolites that may be formed, is irreversibly fixed by any part of the body.

The low energy of the beta emission from carbon 14 makes this isotope more difficult to detect than those more commonly used. It is not possible to experiment on intact animals by using external counters. Further, when used for the assay of carbon 14 in isolated tissues, the Geiger counter must be constructed so as to allow the emitted beta rays free access into the counter's sensitive volume. This can be done by using a Geiger tube with a very thin window, usually mica,[2] or by inserting the material to be assayed directly into the counter.[22] Even in the latter case, self-absorption, i. e., the absorption of the beta rays by the material being assayed, can reduce the sensitivity of the analysis by a large factor. This is especially true when the amount of carbon 14 present is very small as compared to the amount of non-radioactive materials present.

Carbon 14 is easily the most useful radioactive isotope for medical research and possesses great potentialities for medical diagnosis and therapy. Since carbon is the basic substance common to all organic materials, a great variety of compounds containing it may be synthesized, useful for two purposes: (*a*) to afford a mechanism for carrying radioactivity to various specific parts and (*b*) to permit the study of metabolism of organic compounds. Although efforts to discover compounds specificially localized to certain tissues or cells have not been very succesful, this approach offers a possible solution to many medical problems.

The preparation of organic compounds containing carbon 14 often presents difficulties. Compounds which can be prepared by ordinary chemical synthesis are being studied in many laboratories. As the supply of chemical intermediates containing carbon 14 continues to increase, problems of synthesis will become easier to solve. However, many substances of great medical interest cannot be synthesized at the present time. Among these natural products are such drugs as the digitalis glycosides, many of the alkaloids (such as those of the opium and the ergot groups), some of the vitamins and sterols, and proteins. For the past four years the Department of Pharmacology at the University of Chicago has been studying the feasibility of growing plants in sealed chambers with the only source of carbon being the carbon dioxide added to the enclosed atmosphere. Varying amounts of carbon 14 can be added as radioactive carbon dioxide. The carbon 14 is thus incorporated at random into all of the constituents of the plant. By growing the appropriate medicinal plant, drugs labeled with carbon 14 can be obtained. To date, digitoxin and other digitalis glycosides,[23] morphine and other opium alkaloids,[24] nicotine,[25] and atropine [26] have been prepared from radioactive plants grown in the laboratory. Currently under investigation are convallatoxin, the veratrum alkaloids, muscarine, colchicine, khellin, marihuana, and the ergot alkaloids. Radioactive bufotoxin has been prepared [27] by using the tropical toad, Bufo marinus, which is fed on radioactive algae.

The following brief summary of some of the work with radioactive digitoxin illustrates the type of work possible with the aid of these new techniques. Digitoxin is rapidly metabolized to a number of compounds in experimental animals such as the cat, rat, and guinea pig. Whether the cardiac action is attributable to the unchanged digitoxin or to one of the uncharacterized metabolites cannot be determined until they have been isolated and tested, because there is no selective concentration of digitoxin in heart muscle of intact animals.[28] Since the radioactive digitoxin used in these experiments was labeled, in all positions, with carbon 14, all of the metabolites derived from it must conclusively be radioactive; thus, the isolation of these substances is possible. Experiments are also in progress using carbon 14 labeled digitoxin in human subjects.

OTHER RADIOACTIVE ISOTOPES

Radioactive gold is available as gold 198 or gold 199. These isotopes emit both beta and gamma radiation and are used chiefly in the form of colloidal gold injected directly into a tumor mass for local irradiation.[29] Ninety-nine per cent of the gold injected is permanently fixed at the site of injection. Since the half-life of gold 198 is 2.7 days and that of gold 199 is 2.3 days, the radiation continues for a maximum of two to three weeks after fixation. This time is adequate to reduce the activity to less than 1/64 of the original dose. Radioactive gold has also been found useful in chronic leukemia.[30]

Radioactive arsenic has been tried without much success for the treatment of primary and metastatic carcinomas and polycythemia.[30] Radioactive cobalt is being used as a source of gamma radiation in place of radium.

SUMMARY OF ESTABLISHED USES OF RADIOACTIVE ISOTOPES

The principle of selective irradiation of specific tissues through the use of isotopes administered internally already has found clinical application.[31] Radioactive isotopes have been found equal or superior to other forms of therapy for the treatment of chronic myelogenous leukemia, chronic lymphatic leukemia, lymphosarcoma, giant follicular lymphoma, and polycythemia rubra vera. They are also of some value in Hodgkin's disease but are not helpful in acute leukemia and multiple myeloma.[32] Radioactive isotopes are useful in the diagnosis or treatment of some types of carcinoma, especially primary or metastasized carcinoma of the thyroid,[17] breast,[12] or testes.[33] They are the treatment of choice in many cases of hyperthyroidism.[15c] Externally applied, they are of use in the treatment of certain skin lesions.[12]

As diagnostic aids in locating the site of primary tumors or metastases, radioactive phosphorus as sodium phosphate, or radioactive iodine as sodium iodide or as diiodofluorescein,[14] may be used. Radioactive sodium can be used to diagnose disorders of the peripheral circulation and the heart.[19]

The availability of the radioactive isotopes for research furnished investigators with very sensitive new techniques.[34] These new methods make possible the solution of many long-standing problems concerning the metabolism of drugs, since they can be applied where no satisfactory chemical or biologic methods are presently known.

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

R. T. Stormont, M.D., *Secretary.*

Diphtheria and Tetanus Toxoids, Alum Precipitated-U.S.P. (See New and Nonofficial Remedies 1950, p. 435).

Diphtheria-Tetanus Toxoids Combined (Alum Precipitated): 5 cc. vials (five immunizations). Preserved with thimerosal, 1: 10,000. Pitman-Moore Company, Division of Allied Laboratories, Inc., Indianapolis.

Diphtheria and Tetanus Toxoids, Alum Precipitated: 5 cc. (0.5 cc. dose form) and 10 cc. (1 cc. dose form) vials. Five immunizations each. Preserved with thimerosal 1: 10,000. E. R. Squibb & Sons, New York.

Diphtheria Toxoid and Pertussis Vaccine Combined, Alum Precipitated (See New and Nonofficial Remedies 1950, p. 446).

Diphtheria Toxoid, Alum Precipitated, and Pertussis Vaccine Combined: 6 cc. vials (1 cc. dose form). Two immunizations. 15,000 million *H. pertussis* in each cubic centimeter. Preserved with thimerosal 1: 10,000. 7.5 cc. vials (0.5 cc. dose form). Five immunizations. 30,000 million *H. pertussis* in each cubic centimeter. Preserved with thimerosal 1: 10,000. E. R. Squibb & Sons, New York.

Estradial Benzoate-U.S.P. (See New and Nonofficial Remedies 1950, p. 320).

Solution Dimenformon Benzoate in Oil: 1 cc. ampuls. A solution in sesame oil containing 0.1 mg., 0.166 mg., 0.33 mg., 1.0 mg. or 1.66 mg. of estradiol benzoate in each cubic centimeter. Preserved with 0.8% methylparaben and 0.1% propylparaben. 10 cc. vials. A solution in sesame oil containing 0.33 mg. or 2.0 mg. of estradiol benzoate in each cubic centimeter. Preserved with 0.8% methylparaben and 0.1% propylparaben. U. S. Trademark 365,455. Organon, Inc., Orange, N. J.

Estrone-U.S.P. (See New and Nonofficial Remedies 1950, p. 328).

Aqueous Suspension Estrone: 10 cc. vials. A suspension containing 2 mg. of estrone in each cubic centimeter. Preserved with 0.5% phenol. The Bio-Intrasol Laboratories, Inc., Brooklyn.

Solution Estrone in Oil with Benzyl Alcohol 2%: 1 cc. ampuls and 10 cc. vials. A solution in sesame oil containing 1.0 mg. of estrone in each cubic centimeter. Preserved with 0.5% chlorobutanol. The Bio-Intrasol Laboratories, Brooklyn.

Meralluride Injection-U.S.P. (See New and Nonofficial Remedies 1950, page 273).

Solution Mercuhydrin Sodium: 10 cc. vials. A solution of meralluride containing the equivalent of 39 mg. of mercury and 48 mg. of theophylline in each cc. Lakeside Laboratories, Inc., Milwaukee, Wis.

Methapyrilene Hydrochloride (See New and Nonofficial Remedies 1950, p. 32).

Cream Semikon Hydrochloride 2%: 30 gm. tubes and 480 gm. jars. A cream containing 20 mg. of methylpyrilene hydrochloride in each gram. The S. E. Massengill Company, Bristol, Tenn.

Tablets Semikon Hydrochloride 2%: 50 mg. and 100 mg. The S. E. Massengill Company, Bristol, Tenn.

Penicillin for Oral Administration (See New and Nonofficial Remedies 1950, p. 139).

Tablets Crystalline Potassium Penicillin G (Buffered): 250,000 units. Buffered with 0.25 gm. calcium carbonate. Premo Pharmaceutical Laboratories, Inc., South Hackensack, N. J.

Pertussis Vaccine-U.S.P. (See New and Nonofficial Remedies 1950, p. 447).

Pertussis Bacterin (Whole Culture): 1.5 cc. vials (one immunization) and 7.5 cc. vials (five immunizations). 50,000 million *H. pertussis* in each cubic centimeter. Preserved with thimerosal 1: 10,000. Sharp & Dohme, Inc., Philadelphia.

Pertussis Vaccine: 3 cc. (one immunization) and 15 cc. (five immunizations) vials. 30,000 million *H. pertussis* in each cubic centimeter. Preserved with thimerosal 1: 10,000. E. R. Squibb & Sons, New York.

Phenobarbital Sodium-U.S.P. (See New and Nonofficial Remedies 1950, p. 404).

Solution Phenobarbital Sodium with Benzyl Alcohol 2%: 2 cc. ampuls. A solution in propylene glycol containing 0.13 gm. or 0.32 gm. of phenobarbital sodium in each cubic centimeter. Gold Leaf Pharmacal Company, Inc., New Rochelle, N. Y.

Polyamine-Methylene Resin (See The Journal, July 22, 1950, p. 1068).

Powder Exorbin: 1 gm. packets. Ayerst, McKenna & Harrison, Ltd., New York.

Tablets Exorbin: 0.25 gm. Ayerst, McKenna & Harrison, Ltd., New York.

Sodium Folate (See New and Nonofficial Remedies 1950, page 481).

Solution Folvite Sodium with Benzyl Alcohol 1.5%: 10 cc. vials. A solution containing 15 mg. of sodium folate in each cc. Lederle Laboratories, Pearl River, N. Y.

Thiamine Hydrochloride-U.S.P. (See New and Nonofficial Remedies 1950, page 488).

Tablets Thiamine Hydrochloride: 1 mg., 3 mg., 5 mg. and 10 mg. Physicians' Drug and Supply Company, Philadelphia, Penn.

Vitamin B$_{12}$ (See New and Nonofficial Remedies 1950, page 492).

Solution Crystalline Vitamin B$_{12}$: 1 cc. ampuls. A saline solution containing 15 micrograms of vitamin B$_{12}$ in each cc. Kremers-Urban Company, Milwaukee, Wis.

COUNCIL ON PHYSICAL MEDICINE AND REHABILITATION

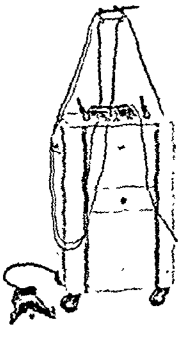
The Council on Physical Medicine and Rehabilitation has authorized publication of the following reports.

HOWARD A. CARTER, *Secretary.*

BOVIE ELECTROSURGICAL UNIT, MODEL O-4, ACCEPTED

Manufacturer: The Liebel-Flarsheim Company, 303 West Third Street, Cincinnati 2.

The Bovie Electrosurgical Unit, Model O-4, is intended for use in all major and minor electrosurgical procedures. It consists of a cabinet that can be rolled about on casters: this has outlets for the cables that run to the operating electrodes. It also bears a cable for the power supply and a cable running to the footswitch assembly. This footswitch controls the current to the operating electrodes.


Bovie Electrosurgical Unit, Model O-4

For operation, the apparatus requires a source of 50 to 60 cycle alternating current at 115 volts. It draws 700 watts of power.

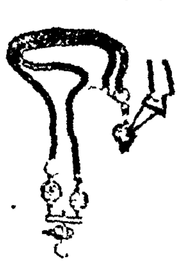
Unpacked, the apparatus measures 67 (height) by 48 by 33 cm. (26½ by 19 by 13 in.) and weighs 48.5 kg. (107 lb.). Packed for shipment it makes a crate measuring 95 by 56 by 70.5 cm. (37½ by 22 by 27¾ in.) and weighing 61 kg. (135 lb.). The foreign shipping weight is 96 kg. The shipping weights include the footswitch, two stainless steel indifferent plates, two chuck handles, endoscopic connecting cord and standard set of surgical electrodes.

Evidence from sources acceptable to the Council indicated that the device was satisfactory in construction and dependable for use in any surgical procedure where electrosurgery is indicated. The Council on Physical Medicine and Rehabilitation voted to include the Bovie Electrosurgical Unit, Model O-4, in its list of accepted devices.

M. S. A. DEMAND PNEOPHORE ACCEPTED

Manufacturer: Mine Safety Appliances Company, Braddock, Thomas and Meade Streets, Pittsburgh 8.

The M. S. A. Demand Pneophore is a device consisting of gas pressure gauges, regulating valves, tubing, and a face mask designed for use in administering oxygen and aerosols to patients. Unpacked, the apparatus weighs 6.8 kg. (15 lb.). Ready for shipment, it makes a package measuring 28 by 51 by 33 cm. (11 by 20 by 13 in.) and weighing 8.6 kg. (19 lb.). The foreign shipping weight is 23.6 kg. (52 lb.). It requires no source of power other than that furnished by the compressed gas in the cylinder.

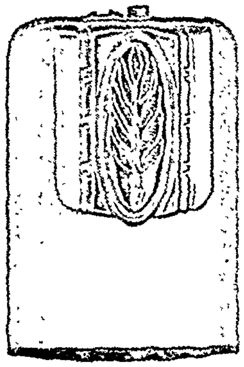

M. S. A. Demand Pneophore

The device is designed to be useful for both "demand" and positive-pressure administration of oxygen. Because of this and because of the claims for therapeutic usefulness in such conditions as pulmonary edema, it appears that medical knowledge is necessary in determining not only which type of operation is adapted to a given case but also what pressure may be applied. Evidence of good construction and dependable performance was obtained from a laboratory acceptable to the Council.

The Council on Physical Medicine and Rehabilitation voted to include the M. S. A. Demand Pneophore in its list of accepted devices with the understanding that it should be used by physicians or under their direct supervision and that a physician should determine how it is to be used and what pressures may be applied in a given case.

DAHLBERG HEARING AID, MODEL D-1, ACCEPTED

Manufacturer: The Dahlberg Company, 2730 West Lake St., Minneapolis 16.

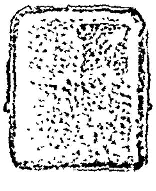

Dahlberg Hearing Aid, Model D-1

The Dahlberg Hearing Aid, Model D-1, was first introduced as the Tonex or Tru-Sonic, Model T-1. It is conventional in electrical design, but remarkable in that the microphone is attached to the clothing clip in such a way as to be outside the wearer's pocket or outer clothing. This clip measures 30 by 37 by 8 mm. The rest of the device measures 62 by 45 by 19 mm. Without batteries, cord, or receiver the device weighs 99 gm. The batteries add 27 gm., and the cord and receiver add 12 gm.

Evidence of satisfactory construction and performance was obtained from sources acceptable to the Council. The Council on Physical Medicine and Rehabilitation voted to include the Dahlberg Hearing Aid, Model D-1, in its list of accepted devices.

PARAVOX HEARING AID, MODEL J (TINY-MYTE), ACCEPTED

Manufacturer: Paravox, Inc., 2056 East Fourth Street, Cleveland 15.


(Tiny-Myte)

The Paravox Hearing Aid, Model J (Tiny-Myte), is an electrical instrument of conventional design and construction, with magnetic receiver. Without switches, clips, etc., it measures 78 by 60 by 16 mm. Without batteries, ear piece or cord it weighs 65 gm. With batteries it weighs 97 gm. Like some other current models, it has no so-called tone control; the manufacturer states that five different magnetic receivers with different frequency response peaks are available. Evidence from sources acceptable to the Council indicated that this device was well constructed, performed as represented by the manufacturer, and satisfied the minimum requirements of the Council for the acceptance of hearing aids. The Council on Physical Medicine and Rehabilitation voted to include the Paravox Hearing Aid, Model J (Tiny-Myte), in its list of accepted devices.

MICRONIC HEARING AID, STAR MODEL, ACCEPTED

Manufacturer: Micronic Company, 727 Atlantic Avenue, Boston 11.

The Micronic Hearing Aid, Star Model, is an electrical hearing aid with magnetic receiver and crystal microphone, conventional in arrangement, design and parts. Excluding hinges, switches, etc., it measures 81 by 45 by 18 mm. Without batteries, ear piece or cord it weighs 66 gm. With batteries it weighs 94 gm.

Evidence from sources acceptable to the Council indicated that this device was well constructed, performed as represented by the manufacturer, and satisfied the minimum requirements of the Council for acceptance of hearing aids. The Council on Physical Medicine and Rehabilitation voted to include the Micronic Hearing Aid, Star Model, in its list of accepted devices.

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RADIATION MYELITIS

During intensive x-ray therapy of structures close to the brain or spinal cord, sufficiently large amounts of radiation may be received by the brain or cord to produce serious damage.[1] That this complication occurs more frequently than is generally realized is indicated by several studies made in the last few years. Boden,[2] for example, found five fatal and five nonfatal cases of radiation myelitis of the cervical cord in a series of 161 patients who received x-ray therapy for malignant tumors of the nose, mouth, pharynx, or cervical lymph nodes. Because of the long latent period between the irradiation and the appearance of symptoms, the cause of the condition was often not recognized initially. Frequently, the patient, discharged by the radiologist during this interval, was seen by a physician who was unaware of the technic of irradiation or of its implications. Symptoms were usually ascribed, without proof, to metastases from the original tumor, and only at autopsy was the true nature of the lesion discovered. The initial symptoms in every case were numbness and tingling in the hands or feet precipitated by flexion or extension of the neck and often associated with pain in the neck and shoulders. In a few cases these symptoms were transient, disappearing in three to nine months. In the remainder the paresthesias were followed by weakness or spastic paralysis of one or more extremities and later by bowel or bladder dysfunction. In the fatal cases there was intercostal paralysis. Death resulted eventually from bronchopneumonia or ascending urinary tract infection. When the number of roentgens received incidentally by the cervical cord during the irradiation therapy of these patients was calculated from their records, it was discovered that most of them had received a higher dose than was intended. Sometimes this was due to overlapping of fields of irradiation from multiple portals and at other times to the physician's miscalculation of radiation factors or failure to elicit a history of previous irradiation to the neck for other purposes.

Subsequently Boden [3] reported seven cases of fatal radiation damage to the brain stem following x-ray therapy of malignant tumors of the middle ear, pharynx, or parotid gland. He found that this catastrophe occurred in the startling proportion of 25% of the patients treated by beam-directed techniques in which multiple small fields were centered on the tumor. The cranial nerve palsies, ataxia, and hemiplegias that appeared 11 to 20 months after irradiation in the older patients were usually attributed to cerebrovascular accidents until autopsy proved the error of this diagnosis. As a result of his dosage calculations in these two series of patients, Boden concluded that the limit of tolerance of the central nervous system is 3,500 to 4,500 r, depending on the size of the fields used. He warned that, with doses above this level, symptoms are likely to occur.

Prior to Boden's study Ahlbom [1b] observed four fatal cases of radiation myelitis of the cervical cord in a series of 235 cases of cancer of the hypopharynx treated with x-rays or radium, and Stevenson and Eckhardt [4] reported a fatal case in which the cervical cord received 6,000 to 8,000 r during intensive radiation therapy for lymphoepithelioma of the nasopharynx. Radiation myelitis of the thoracic portion of the spinal cord occurred in a patient reported by Smithers, Clarkson, and Strong,[5] who received a depth dose of 5,800 r in 39 days for carcinoma of the esophagus. Similar involvement of the lumbosacral segment of the cord was recorded by Greenfield and Stark [6] in three patients out of a series of 180 following irradiation of retroperitoneal nodes for carcinoma of the testis. The spinal cords of these patients received between 4,500 and 5,500 r.

In all these cases the delayed onset of the symptoms and the microscopic findings at autopsy suggested that the roentgen rays affected primarily the blood vessels rather than the neurones and that the eventual neurologic lesions were the result of gradual impairment of blood supply. This is in keeping with the concept that blood vessels are much more susceptible to radiation damage than is nerve tissue. The lesions of radiation myelitis can be distinguished clinically from those of metastases to the spine or cord by the absence of roentgenographic changes in the vertebrae and the absence of changes in the spinal fluid (with the exception of an occasional elevated protein level) in the former. Prevention of catastrophes of this kind, according to Boden, depends on the modification of radiotherapeutic techniques so that as far as is possible, radiation of the central nervous system is avoided. When it is necessary to irradiate tumors situated near the spinal cord or brain, the depth dose received by these structures should routinely be estimated and should be kept as low as possible, preferably below 3,500 to 4,500 r.

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[1] (*a*) Warren, S.: Effects of Radiation on Normal Tissues: IX. Effects on Nervous System, Arch. Path. **35**: 127 (Jan.) 1943. (*b*) Ahlbom, H. E.: Results of Radiotherapy of Hypopharyngeal Cancer at Radiumhemmet, Stockholm, 1930 to 1939, Acta radiol. **22**: 155, 1941.

[2] Boden, G.: Radiation Myelitis of Cervical Spinal Cord, Brit. J. Radiol. **21**: 464 (Sept.) 1948.

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[4] Stevenson, L. D., and Eckhardt, R. E.: Myelomalacia of Cervical Portion of Spinal Cord, Probably Result of Roentgen Therapy, Arch. Path. **39**: 109 (Feb.) 1945.

[5] Smithers, D. W.; Clarkson, J. R., and Strong, J. A.: Roentgen Treatment of Cancer of Esophagus, Am. J. Roentgenol. **49**: 606 (May) 1943.

[6] Greenfield, M. M., and Stark, F. M.: Post-Irradiation Neuropathy, Am. J. Roentgenol. **60**: 617 (Nov.) 1948.

SUBCLINICAL INFLUENZA

Confirmation of the current theory of subclinical infection is reported by Kalter[1] of State University, Syracuse, N. Y. This is based on a study of the development of influenzal antibodies in eight students engaged in research with influenza virus. Three stains of virus (PR8, Lee, and Fm-1) were used in their investigations, which consisted in inoculations, harvesting and titrations of these strains over a period of three to four months. Hemagglutination-inhibition titers were taken of the serums of these eight students before this research was begun. Titers were also taken after two months of laboratory exposure and at the end of their work. Control titrations were made of the serums of 57 fellow students not engaged in this research.

The initial serum samples of all students had antibody titers varying from 40 to 640 units. The titers were highest against the Lee strain, presumably owing to a previous Syracuse influenza B epidemic. By the end of the test period, six of the eight students in the research group showed a fourfold to a thirtyfold increase in antibody titer against all three strains. The remaining two students of this group showed similar increases to but one or two of the three strains. There was no demonstrable antibody increase in the control group of 57 students. None of the test group had any clinical symptoms resembling influenza during the test period. The increased antibody titer was thus presumably due to subclinical or inapparent infection with one or more (usually all three) of the test viruses.

THERMAL GRADIENTS IN THE VASCULAR SYSTEM

Recent data on intracardiac and deep intravascular temperatures are of interest, since the mechanisms that normally maintain temperature within narrow limits are not yet well understood. Horvath, Rubin, and Foltz[1] measured the temperature in various blood vessels and tissues in the anesthetized dog by means of thermocouples fitted into plastic catheters and reported the presence of thermal gradients in the vascular tree, indicative of sites of increased heat production. Employing similar techniques, Eichna and his associates[2] measured the temperature in the right side of the heart, in the deep vessels leading to the right side of the heart, in the femoral artery, and in the rectum in 24 afebrile and five febrile hospitalized subjects. Temperatures in the right side of the heart, pulmonary artery, and femoral artery were found to be equal and consistently less than that in the rectum. In afebrile patients, the average difference between rectal temperature and that of the right side of the heart was 0.25 C.; in febrile patients differences as great as 0.8 C. were noted, the differences being greater in patients with higher fevers. The temperatures in the superior vena cava and in the femoral artery were approximately equal to those of the right atrium, while progressively lower temperatures were recorded as the thermocouple was moved from the right atrium into the superior vena cava and into the subclavian vein. On the other hand, the temperature rose as the thermocouple passed from the subclavian into the common jugular vein, and at the level of the jugular bulb it equaled the rectal temperature. The temperature of the hepatic vein blood also equaled that of the rectum.

Clinically, body temperature is usually determined by measurement of the temperature in the mouth, rectum, axilla, or groin. The studies of Horvath, of Eichna, and of Bazett[3] and their associates offer evidence of a complex pattern of local areas of heat production and heat loss within the body; hence a single temperature measurement gives an inadequate picture of the temperature in other parts of the body. If maintenance of thermal homeostasis depends on the temperature of the blood reaching the hypothetical temperature-regulating center in the hypothalamus, intracardiac and femoral arterial temperatures should be of considerable significance, since the temperature of the blood entering the critical tissue is more likely to be indicated by these temperatures than by any other measurement now available.

UTILIZATION OF NONSPECIFIC NITROGEN

It is well known that the rat will grow and maintain its nitrogen balance on rations whose nitrogen content is derived exclusively from mixtures of the so-called essential amino acids. The usual protein sources, on the other hand, are made up of about 20 different amino acids, and the eight amino acids which Rose found essential to maintain nitrogen balance in man compose only about 40 to 50 per cent of the protein.

It is of interest to determine whether the nonessential amino acids are necessary for the optimum utilization of the essential ones and, also, to what degree the essential amino acids can be replaced by nonspecific nitrogen donors. These problems were recently studied by Frost and Sandy,[1] using the method of repleting rats that had been on a protein-deficient diet, a procedure developed earlier by Cannon. These investigators had shown that there was poor repletion of rats fed a mixture of the essential amino acids minus arginine, but, if isonitrogenous diets were used in which one-fifth to one-third of the nitrogen was replaced by arginine, glutamic acid, ammonium acetate, or diammonium citrate, a marked increase in appetite and body weight of the animals occurred. More striking, the weight increase of these animals compared favorably with that of rats receiving protein of high biologic value. For the rat, this work would indicate that at least 20% of the total nitrogen should be in the form other than essential amino acids to promote maximum utilization by the tissues. The actual form of this extra nitrogen appears to be nonspecific, and any ammonium salt or nitrogenous substance that, in the process of metabolism, gives rise to ammonia can be used. Work of this type is of considerable interest, since such data are essential to the preparation of amino acid mixtures for intravenous alimentation which will provide most efficient utilization of the injected nitrogen.

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[2] Eichna, L. W.; Berger, A. R.; Rader, B., and Becker, W. H.: Comparison of Intracardiac and Intravascular Temperatures with Rectal Temperatures in Man, J. Clin. Invest. **30**: 353 (April) 1951.

[3] Bazett, H. C.: Blood Temperature and Its Control, Am. J. M. Sc. **218**: 483 (Nov.) 1949.

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ORGANIZATION SECTION

STUDENT A. M. A.

Russell F. Staudacher, formerly of Lansing, Mich., who joined the American Medical Association and its Council on Medical Service May 1, 1951, has been named to a new and dual capacity with the organization. On July 1, he assumed the duties of executive secretary for both the Student American Medical Association and the American Medical Education Foundation. Prior to his association with the American Medical Association, Mr. Staudacher served as Associate Public Relations Counsel for the Michigan State Medical Society for several years. He also acted as public relations consultant to the Lansing (Mich.) Board of Education.

Immediately after military service he worked for the St. Louis public relations counseling firm of Frank Block and Associates. A World War II veteran with nearly four years' service with the Air Force in the European Theater in public relations, Staudacher also served on the USAAF public relations staff assigned to the 1945 atomic bomb tests on Bikini Atoll. He entered the Reserve Corps in 1945 as a major. Mr. Staudacher graduated from Alma (Mich.) College with a bachelor of arts degree and life teacher's certificate. He is married and has one son.

MEDICAL EDUCATION AND HOSPITALS

From time to time correspondence received at American Medical Association headquarters offices will be reproduced with their replies when it is believed that this correspondence will be of general interest to the readers of THE JOURNAL.—ED.

QUESTION.—*A hospital has had an application for appointment to their intern staff from a graduate of a foreign medical school which is not on the Council's list. May this man be appointed without jeopardy to the hospital's approved status?*

ANSWER.—Yes. Graduates of foreign medical schools may be appointed at the discretion of the hospital without prejudicing the hospital's approval for intern training. Lacking adequate information regarding the professional training which these schools provide, however, the Council does not assume any responsibility for evaluation of the graduate's credentials.

QUESTION.—*A hospital has been approved by the Council as offering satisfactory training in general surgery in preparation for a residency in a surgical specialty. After having completed one year of training in this hospital, the resident decides he wants to qualify for examination in general surgery. Will he receive credit by the American Board of Surgery for the year of training he has had?*

ANSWER.—No. Programs of this type have been approved to provide facilities for training in general surgery for residents who are qualifying for examination by one or another of the surgical specialty boards; e. g., American Board of Urology. Training in general surgery of less than three years' duration is accepted by the American Board of Surgery only if the program is integrated with that of a hospital which is fully approved (*J. A. M. A.* **142**:1216 [April 15] 1950).

QUESTION.—*How many x-ray and fluoroscopic machines are there in the United States?*

ANSWER.—This office does not have information on the number of x-ray and fluoroscopic machines in the United States, but according to our records a total of 5,386 registered hospitals have x-ray departments. Many of these, of course, have several x-ray units for roentgenographic and fluoroscopic procedures, besides studies and low and high voltage x-ray therapy.

We have also been informed that the publishers of *Modern Medicine* (84 South 10 St., Minneapolis) made a study some time ago of x-ray facilities in the medical and hospital fields. Their report indicated that x-ray equipment was owned by 5,170 hospitals and 32,250 physicians in the United States.

QUESTION.—*What are the qualifications necessary for a hospital staff appointment?*

ANSWER.—In general, it is required that the medical staff of a hospital should be limited to graduates in medicine who are properly qualified by training, licensure and ethical standing and are proficient in the fields of practice to which they devote themselves.

It has been further stated, however, that hospital staff appointments should depend on the qualifications of physicians to render proper care to hospitalized patients, as judged by the professional staff of the hospital, and not on certification or special society membership. Qualifications, therefore, are directly related to the amount of training and experience that individual physicians have obtained in their respective fields.

STATE LEGISLATION

California

Bills Enacted.—H. R. 155, was adopted June 22, 1951. It provides for the creation of an Interim Committee on Public Health to, among other things, study and analyze all matters relating to or affecting **public health** including needed revision of any and all laws in any way bearing upon the subject. H. R. 194 was adopted June 22, 1951. It provides for the creation of an Interim Committee on Finance and Insurance to study, among other things, **voluntary plans of hospital and/or health insurance** or plans operating under provision of the law to protect persons from the high costs of sickness and accidents in the state and other unregulated plans purporting to operate under existing provisions of law, and the need for regulation under existing laws or the enactment of regulatory legislation. H. R. 195 was adopted June 22, 1951. It provides for the creation of an Interim Committee on Finance and Insurance to study and analyze all facts relating to the furnishing of **pre-paid medical, surgical, hospital and other related services,** especially by unlicensed, unregulated and nonprofessional persons and organizations. S. R. 187, was adopted June 23, 1951. It creates an Interim Committee on **Narcotics and Hypnotics** to ascertain, study and analyze all facts relating to narcotics and hypnotics including the operation, effect, administration, enforcement and needed revision of all laws bearing upon the subject of the committee's duties. S. R. 214, was adopted June 23, 1951. It creates an Interim Committee to study and analyze all facts relating to a **shortage of nurses.** S. 731, has become Chapter 1201 of the Laws of 1951. It amends the health and safety code by requiring hospitals to keep a record of the **administration of hypnotic drugs,** including the amount given, the type, the date, and the name and address of the person to whom administered. S. 820 has become Chapter 1149 of the Laws of 1951. It amends the law relating to **narcotics** by making it a felony to sell, give away or prepare for sale or administer any narcotic to a minor.

Pennsylvania

Bills Introduced.—H. 1449 proposes to amend the law relating to mental illness, mental defect, epilepsy and inebriety by defining the word **"qualified physician"** as including osteopath. H. 1497 proposes general amendments to the **mental health act.** H. 1510 relates to the supplying of **insulin to diabetic pupils** in the public schools. H. 1524 proposes an appropriation of five hundred thousand dollars ($500,000) to the Department of Health for a study of **alcoholism** and treatment and rehabilitation of alcoholics. S. 746 proposes to require water companies to **treat water with sodium fluoride** when the governing body of any city, borough, town or township has, by ordinance or resolution, determined that the water supply thereof should be so treated.

Texas

Bills Enacted.—H. C. R. 108, was adopted June 8, 1951. It resolves that the House go on record as requesting this Board of State Hospitals and Special Schools to take the necessary steps to meet the **minimum standards** required in order to qualify the said **Hospitals and Special Schools** operated by the State of Texas to the necessary standards for residency, intern and nurses training programs so that the patients of the said Hospitals and Special Schools be given the highest type of medical care and treatment possible. S. 290 was approved June 15. It amends the medical practice act by authorizing the issuance of **temporary licenses to practice medicine** which shall be in effect until the next regular meeting of the board of examiners. S. 291 was approved June 15, 1951. It amends the basic science act by permitting the issuance of **temporary licenses** to be effective until the next regular meeting of the board. S. 295 was approved June 15, 1951. It makes it unlawful to sell or deliver any **barbituric acid,** amphetamine and desoxyephedrine except by a pharmacist upon an original prescription of a physician, dentist, chiropodist or veterinarian.

This summary was prepared by the Bureau of Legal Medicine and Legislation.

MEDICAL NEWS

ARKANSAS

Rural Health Conference.—The rural health committee of the Arkansas Medical Society, with the assistance of the Farm Bureau Federation, the Arkansas Dental Association, the Council of Home Demonstration Agents, and the Extension Service of the University of Arkansas, is sponsoring a conference in Little Rock August 9-10. The purpose is to help the medical profession and the rural citizens to assess their individual responsibilities in the solution of Arkansas' rural health problem.

CALIFORNIA

Retiring Professors Honored.—Three retiring members of the faculty of the University of California School of Medicine, San Francisco, were honor guests at the banquet of the school's alumni association June 15. They are Dr. Edwin I. Bartlett, associate clinical professor of surgery and pathology; Dr. LeRoy H. Briggs, William Watt Kerr Clinical Professor of Medicine, and Dr. Howard C. Naffziger, professor of neurological surgery and chairman of the department.

Personals.—Dr. Jacob C. Geiger, director of public health, City and County of San Francisco, recently received the Honorary Knighthood of the Royal Order of Dannebrog.——Dr. Edwin E. Kerr, assistant in surgery, University of California Medical School, San Francisco, has been awarded the $250 Helmut William Fesca Prize for 1951 as a member of the resident staff of the division of surgery who has done outstanding work during the last year. The prize was established by various donors in memory of Dr. Helmut William Fesca, who died July 27, 1944.

FLORIDA

State Medical Election.—At the annual meeting of the Florida Medical Association in Hollywood, April 22-25, Dr. David R. Murphey Jr., Tampa, was installed as president. Elected officers include Dr. Robert B. McIver, Jacksonville, president-elect, and Dr. Samuel M. Day, Jacksonville, secretary-treasurer.

GEORGIA

Dr. Shanks Honored.—Dr. Edgar D. Shanks, who has practiced medicine in Atlanta for 25 years, was presented a silver service July 1 by more than 50 friends in appreciation of his "faithful and loyal service to medicine in Georgia." Dr. Shanks served 16 years as secretary-treasurer of the Medical Association of Georgia and as editor of the association's journal. He also has served on numerous committees of the Fulton County Medical Society and was elected to its presidency in 1935.

INDIANA

Narcotic Violation.—Dr. Joseph A. Wall, Wabash, pleaded guilty at South Bend to a violation of the federal narcotic law and on May 14 was sentenced to a term of three years. The sentence was suspended and he was placed on probation for a period of five years.

Rural Health Conference.—This conference will be held July 31 at Purdue University, Lafayette, under the sponsorship of the committee on rural health of the Indiana State Medical Association in cooperation with the Agricultural Extension Service of the university. Out-of-state speakers include Dr. Herman N. Bundesen, commissioner of health of Chicago; Dr. Josiah J. Moore, Chicago, member of the National Brucellosis Committee, who will speak on "The Nation and Brucellosis," and Dr. George F. Bond, Bat Cave, N. C., whose subject will be "Here's Health the American Way." There will be a panel discussion on brucellosis. In the afternoon Mr. Robert Yoho of the Indiana State Board of Health will be moderator for a panel discussion, "Using Your Community Health and Medical Services to the Best Advantage."

KENTUCKY

General Practitioners Elect Officers.—At a meeting of the Kentucky Academy of General Practice in Louisville June 3 Dr. Richard R. Slucher, Buechel, was installed as president; other officers are Dr. Joe M. Bush, Mt. Sterling, president-elect; Dr. Keith P. Smith, Corbin, vice president, and Dr. David G. Miller Jr., Morgantown, secretary-treasurer.

Personals.—Dr. Frank M. Gaines Jr., Louisville psychiatrist, has been appointed state director of hospitals and mental hygiene succeeding Dr. Addie M. Lyon, now superintendent of the Central State Hospital, Lakeland. Dr. Gaines formerly held the position of clinical director of Norton Psychiatric Clinic, Louisville.——Dr. Lucius E. Smith, Louisville, has resigned as executive secretary of the Kentucky Tuberculosis Association. Dr. Smith was paid tribute at a luncheon and a dinner in Louisville April 27.——Dr. Robert Lich Jr., head of the urology department, University of Louisville School of Medicine, has been named a member of the Society of Genito-Urinary Surgeons. He is the only Kentucky urologist ever admitted to this organization.

MASSACHUSETTS

University News.—Harvard University, Boston, has allocated two-thirds of the $300,000 Ford Foundation grant it received last October to its medical school for a five-year study of the physiological and psychological effects of adrenal hormones.

Award Alvarenga Prize.—On July 14 the College of Physicians of Philadelphia awarded the Alvarenga Prize for 1951 to Dr. George W. Thorn, Hersey Professor of the Theory and Practice of Physic, Harvard Medical School, Boston, for his contributions on the role of the adrenal cortex in health and disease. The prize was established by the will of Pedro Francisco DaCosta Alvarenga of Lisbon, Portugal, an associate fellow of the college, to be awarded annually by the college on the anniversary of the death of the testator.

MINNESOTA

State Board Regulates Children's Camps.—Regulation of children's camps in Minnesota was made the responsibility of the state board of health by the 1951 state legislature. Every summer between 200 and 300 camps for children are conducted in Minnesota. Some are run by private individuals; others are operated as a public service by churches or by youth organizations. The Minnesota Camping Association, with membership representing many of the camps and youth organizations, was responsible for introduction of the new legislation. The state board of health is authorized to issue yearly free permits for the operation of children's camps, and these are already being issued. State department of health personnel will visit the camps annually and will inform the operators of any failure to protect the health or safety of children.

Dr. Bittner Wins Cancer Award.—John J. Bittner, *Ph.D.*, director of the division of cancer biology of the University of Minnesota, is the first winner of the Comfort Crookshank Award for Cancer Research, an honor presented through the Middlesex Hospital Medical School in London, England. In September Dr. Bittner will go to London to receive the silver medal award and the monetary grant of 230 English pounds ($644) which goes with it. He will deliver a lecture on his cancer research at the medical school. The award, from funds donated by the late Bessie C. Crookshank, will be presented triennially to a scientist who has made valuable contributions to cancer research. Dr. Bittner is past president of the American Association for Cancer Re-

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Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

search and the winner of the 1950 medal of the American Cancer Society. He was a member of the Medical Teaching Mission to Austria in 1947, sponsored by the Unitarian Service Committee and the World Health Organization. In 1947 Dr. Bittner was the official United States delegate to the Fourth International Cancer Research Congress.

MISSOURI

Rehabilitation Institute Moves to New Quarters.—The Vocational Rehabilitation Institute, Kansas City, has moved to a three-story building recently acquired as its permanent home. The institute is operated by 17 social agencies. Its medical policies are under the direct control of the Jackson County Medical Society through the medium of a medical advisory committee. On the first floor are the curative workshops, speech department, recreational space, and a layout for the projected therapeutic pool. Physical therapy and occupational therapy departments are on the second floor. The enlarged quarters made possible the addition of the ceramics and printing departments. The National Foundation for Infantile Paralysis is extending its scope to include services at the institute.

NEW JERSEY

Personal.—Dr. Henry H. Kessler, medical director of the Kessler Institute for Rehabilitation, West Orange, recently received the Edward J. Ill Award for 1951 from the Academy of Medicine of Northern New Jersey.

Cancer Grant to Rutgers.—The Damon Runyon Memorial Fund for Cancer Research has made a grant of $20,000 to Rutgers University bureau of biological research, New Brunswick, to continue and expand its study of chemical controls for cancer. The fund has made two other grants to the bureau: $10,000 in 1949 toward chemo-therapeutic studies and $5,000 in 1950 for the study of carcinogens.

Award in Orthopedics.—The New Jersey Orthopaedic Society offers an award of $100, open to all residents and interns in the State of New Jersey, for the best paper on an orthopedic or closely related subject. The paper selected will be read by the author at the spring meeting of the society in 1952. Papers are to be submitted on or before Jan. 15, 1952, to the secretary, Dr. Philip Willner, 852 S. 11th St., Newark 6.

NEW YORK

Dr. Campbell Named Dean at Albany.—Dr. James A. Campbell, assistant professor of medicine at the University of Illinois College of Medicine, Chicago, has been appointed dean of Albany Medical College, effective Sept. 1. Dr. Robert S. Cunningham, dean since 1937, will be given new responsibilities as executive director of the Albany Medical Center Council, a position he has held since May 1950. Dr. Campbell, a graduate of Harvard Medical School, Boston, in 1943, was appointed in 1946 executive officer of the medical division of the clinical research section at the Army Chemical Center, Edgewood Arsenal, Md. In 1947 he was named Harvey Cushing Fellow at Johns Hopkins Hospital and Medical School in Baltimore. He joined the staff of Presbyterian Hospital, Chicago, as assistant attending physician in 1948. Last year he was appointed associate attending physician and is in charge of the clinical teaching of medicine there. Dr. Campbell is 33 years old.

New York City

Dr. Rabinoff to Direct Department.—Dr. Sophie Rabinoff, since 1947 associate professor in public health at New York Medical College, Flower and Fifth Avenue Hospitals, has been appointed professor and director of the department of public health and industrial medicine. She has been connected with the Department of Health of New York City since 1934.

Changes in Hospital Directors.—Dr. Christopher F. Terrence has been appointed director of Rochester State Hospital, and Dr. Richard V. Foster, director of Gowanda State Hospital, effective July 1. Dr. O. Arnold Kilpatrick, former director at Rochester, has been transferred to Hudson River State Hospital, and Dr. Charles Buckman, former director at Gowanda, has been promoted to assistant state commissioner of mental health.

Personals.—Dr. Morton L. Levin, director of the office of medical services in the state department of health, who has been on leave of absence for a year at American Medical Association headquarters in Chicago, directing the program of the Commission of Chronic Illness, has returned to the department.——Dr. Walter Levy has been elected president of the Alumni Association, New York University College of Medicine, a unit of the New York University-Bellevue Medical Center.

NORTH CAROLINA

Critical Nursing Shortage.—Duke Hospital, Durham, may have to close some of its beds or turn away some patients unless the current nursing shortage can be met, according to F. Ross Porter, the superintendent. The shortage of nurses at Duke has reached "critical proportions," he said, mainly because the hospital is now admitting the largest number of bed patients in its 20-year history.

Annual Medical Symposium.—The fifth annual medical symposium sponsored by the New Hanover County Medical Society will be held at Wrightsville Beach August 24. Among the principal speakers will be:

Hans Selye, Montreal, Canada, Cortisone and Corticotrophin (ACTH).
Charles F. McKhann, Cleveland, Convulsive Disorders.
John Pemberton, Rochester, Minn., Carcinoma of the Thyroid.
Isaac S. Tassman, Philadelphia, Fundus Changes in Vascular Disorders.
Robert W. Johnson Jr., Baltimore, Arthritis.

Officers of the society are Dr. Elbert C. Anderson of Wilmington, president, and Dr. William F. Barefoot of Wilmington, secretary.

OHIO

Narcotic Violation.—Dr. Louis R. Effler, Toledo, pleaded *nolo contendre* in the United States District Court at Toledo to a violation of the federal narcotic law and on June 15 was fined $200 and costs.

Dr. Sherry Succeeds Dr. Mirsky.—Dr. Solomon Sherry, New York, has been appointed director of the May Institute for Medical Research of the Jewish Hospital Association and assistant professor of the department of internal medicine at the University of Cincinnati School of Medicine, succeeding Dr. I. Arthur Mirsky, who has been made professor of clinical science and professor of research psychiatry at the University of Pittsburgh School of Medicine. Dr. Sherry had been assistant professor of medicine at New York University College of Medicine and assistant visiting physician at Bellevue Hospital, New York. During World War II he served in the medical corps of the army as flight surgeon with the rank of major and was awarded the U. S. Army Typhus Commission Medal for work on typhus control in Bavaria.

PENNSYLVANIA

Society News.—The third annual meeting of the Pennsylvania Academy of General Practice was held in Bedford May 25-27. Among the speakers were Drs. Charles P. Bailey and William A. Jeffers, both from Philadelphia; Dr. Philip Thorek, Chicago, and Dr. Roger B. Scott, Cleveland. New officers elected were as follows: Dr. Benjamin Schneider, Danville, president; Dr. Harry K. Marcy Jr., Pottstown, vice president; Dr. Anthony T. Merski, Erie, president-elect, and Dr. Horace W. Eshbach, Drexel Hill, secretary-treasurer.——The annual meeting of the Reading Eye, Ear, Nose and Throat Society was held June 20 at the Reading Hospital in West Reading. Principal speakers included the following:

Ramon Castroviejo, New York, Modern Concepts in Glaucoma Surgery, and Methods and Techniques in Ocular Surgery.
Benjamin H. Shuster, Philadelphia, Cranial Nerves in Otolaryngology.
Charles H. La Clair Jr., Norristown, Pa., Spontaneous Intramaxillary Hemorrhage.

Officers elected for the ensuing year include Dr. Harold L. Strause, president; Dr. J. Van Dyke Quereau, president-elect; Dr. Philip R. Wiest, treasurer, and Dr. Benjamin F. Souders, secretary.

Philadelphia

Personals.—Dr. Chevalier Jackson, professor of laryngology and broncho-esophagoscopy at Temple University School of Medicine, is president of the Philadelphia Civic Opera Company. ——Dr. Charles L. Brown, dean of the Hahnemann College and Hospital of Philadelphia, has been appointed as chief consultant in internal medicine on the board of central office consultants of the Veterans Administration.

Fellowship in Ophthalmology.—A two-year fellowship in ophthalmology has been added to the list of postgraduate training opportunities of the Woman's Medical College. The fellowship is under the direction of Dr. Eunice LeBaron Stockwell. The program will be carried out in the Hospital of the Women's Medical College of Pennsylvania, the Woman's Hospital, Pennsylvania School for the Deaf, and the Childrens' Heart Hospital. The first fellow is Dr. Marilyn Rigg of Los Angeles.

Pittsburgh

Studies on Inheritance.—Dr. Ching Chun Li, newly appointed research fellow in biostatistics, will conduct studies on inheritance in relation to public health problems at the Graduate School of Public Health, University of Pittsburgh. Dr. Li was graduated from the University of Nanking, China, in 1936. From 1946 to 1950, after graduate work at Cornell, University of Chicago, Columbia University, and North Carolina State College, he was professor and head of the department of agronomy at the National Peking University in Peiping, China. He left this position when the Chinese Communist government forbade the teaching of the Mendelian principles of heredity because they are unacceptable to communist ideology. Dr. Li's return to this country was made possible through the efforts of the Genetics Society of America.

TENNESSEE

State Medical Election.—Dr. Ernest G. Kelly, Memphis, was installed as president of the Tennessee State Medical Association at its recent annual meeting. Officers elected include Dr. Daugh W. Smith, Nashville, president-elect; Dr. Charles C. Trabue IV, Nashville, speaker of the house, and Dr. Rudolph H. Kampmeier, Nashville, secretary-editor.

Dr. Overman Directs Laboratory.—Richard R. Overman, Ph.D., Knoxville, has been appointed director of the laboratory of clinical physiology at the University of Tennessee, Knoxville. This laboratory is a portion of the Institute of Clinical Investigation, which has recently been established as an adjunct of the Medical Units of the university and the John Gaston Hospital. The new laboratory is intended to perform basic physiological determinations on the hospital patients and to promote clinical research programs. Dr. Overman has been associate professor of physiology in the University of Tennessee School of Biological Sciences since 1948.

VIRGINIA

Personals.—Dr. Claude C. Coleman, professor of neurological surgery and chairman of the department of the Medical College of Virginia, Richmond, has resigned from his teaching duties after 42 years of service, but will continue to do consulting work at the college after his resignation becomes effective July 1. The honorary degree of doctor of science was conferred on Dr. Coleman at the commencement exercises June 5.——Dr. William R. Bond, Richmond, has been made director of clinical research for the A. H. Robins Co., Inc., of Richmond. He is a lecturer in physiology at the Medical College of Virginia.

Visiting Professor to African University.—Dr. Sydney W. Britton, professor of physiology, University of Virginia, Charlottesville, has been appointed visiting professor of endocrinology at the University of Nigeria and will leave for Africa in February, 1952. Announcement of the award of the visiting professorship was made by the Department of State under terms of the Fulbright Act. While in Africa Dr. Britton will continue his investigations on endocrine involvement in the maintenance of the upright position, using primates available in the region. He will be on leave of absence from the University of Virginia during the second semester and will retire at the end of the year after 24 years of service.

WEST VIRGINIA

Personals.—Dr. Thomas L. Harris, Parkersburg, a past president of the West Virginia State Medical Association, has been appointed to the board of governors of West Virginia University for a term ending June 30, 1960.——Dr. George F. Evans, Clarksburg, has been reappointed a member of the medical licensing board for the term ending June 30, 1956. He has been on the board since its creation by the legislature in 1949.——Dr. Delivan A. MacGregor, Wheeling, has been appointed a member of the state board of health for the unexpired term of Dr. Robert J. Reed, also of Wheeling, who resigned late in June. Dr. MacGregor's term will expire June 30, 1956.

Osteopathy a Limited Practice.—The attorney general of West Virginia on June 18 handed down an opinion that affects practice in West Virginia by osteopathic physicians and surgeons. In the opinion, which was written by T. D. Kauffelt, assistant attorney general, it was held that "osteopathic physicians and surgeons are entitled to the same rights and privileges as doctors of medicine in the treatment of cases only to the extent that their treatment remains within the field of osteopathy as defined by the legislature." The opinion ends with the statement that such treatment "is generally considered to exclude the administration of drugs and operative surgery." The matter was officially laid before the attorney general by Dr. Newman H. Dyer, state director of health, acting at the direction and on behalf of the state board of health and the medical licensing board. These two state agencies had previously been requested by the council of the West Virginia State Medical Association to seek an opinion from the attorney general concerning the legality of practice by osteopathic physicians of the same type of medicine and surgery now practiced by doctors of medicine.

GENERAL

Award in Otology.—Theodore H. Bast, Ph.D., of the University of Wisconsin Medical School, Madison, and Barry J. Anson, Ph.D., of Northwestern University Medical School, Chicago, received jointly the award of merit of the American Otological Society at its annual meeting in Atlantic City, N. J., May 12. Each received a silver medallion and a check for $500. Drs. Bast and Anson have been associated for many years in a special study of embryology and anatomy of the temporal bone and the ear. Much of their work, supported by the central bureau of the American Otological Society, has been summarized in a book "The Temporal Bone and the Ear," published in 1949. This is the society's second award for outstanding service in research in otology and in the interest of encouraging research on the problems of impaired hearing.

WHO Ships Mobile Health Units.—Three mobile health units, gifts from the World Health Organization to the governments of Jordan, Syria, and Lebanon, have been shipped from Alexandria, Egypt, to Beirut, Lebanon. The gift to Jordan is a $9,600 mobile dispensary built in Egypt on a bus chassis. The body contains a clinic and a laboratory as well as a dispensary. The unit will be used in desert and semidesert areas to carry medical and clinical services to remote places where no medical aid is available. The gifts to Syria and Lebanon are mobile public health education units. They contain posters, film projectors for outdoor showings, and public address systems with amplifiers and loudspeakers. On arrival in Beirut all three units will be handed over to the public health services concerned.

Committee Seeks More Exact Causes of Blindness.—The Committee on Statistics of the Blind at a recent meeting voted to make minor changes in the official classification of causes of blindness in order to obtain more complete statistics. It seeks more exact data on the number of premature infants becoming blind as a result of "retrolental fibroplasia," which has appeared only in the last few years, as well as more complete data on blindness from onchocerciasis and toxoplasmosis, parasitic diseases. The committee was first organized in 1930, and the classification on causes of blindness worked out by the group has since been adopted as standard throughout the world. Present members of the committee are Ralph G. Hurlin, Ph.D., New York, chairman, and Drs. Conrad Berens, Marta Fraenkel, and Raymond L. Pfeiffer of New York; Gabriel Farrell, D.D., Watertown, Mass.; Dr. Trygve Gundersen, Boston, and Dr. Carl E. Rice and Anne E. Geddes, Washington, D. C.

Art Association Awards.—Among the winners of the American Physicians Art Association exhibit held in Atlantic City, N. J., June 11-15 were Dr. Sol Fineman, New York, who won the Helser Cup for Yankee Ingenuity, and Dr. Richard H. Gwartney, San Bernardino, Calif., the Helser Second Cup. The Popularity Trophy was won by Dr. Leonard B. Fauguier, Jersey City, N. J. Thirteen first prizes were awarded in the advanced and beginners classes of media. Officers of the association for the coming year are Dr. Meyer M. Melicow, New York, president, and Dr. Francis H. Redewill, San Francisco, secretary-treasurer.

Cancer Mortality.—Encouraging indications of a decline in cancer mortality are reported by statisticians of the Metropolitan Life Insurance Company, who base their findings on the postwar experience of the company's millions of industrial policyholders. According to the report, for the accessible sites as a group, declines in the death rate for both men and women were recorded from 1946-47 to 1949-59, men by 2.4% and women by 7.2%. There was a reduction in female mortality from almost all the accessible specific types of cancer. In the case of the inaccessible sites as a whole, the death rate among women declined 1.1%, but, on the other hand, that among men showed an increase of 4%. However, both sexes showed decreases for such specific sites as the stomach, intestines, other digestive organs, bladder, and liver. Increases in death rates were recorded for cancer of the lungs and other respiratory areas.

Project in Weight Reduction.—Persuading the 25 million adult Americans who are overweight to lose their excess poundage through intelligent dieting under medical supervision has been made a major public health project by the Metropolitan Life Insurance Company. The purpose is to effect an improvement in general health by reducing the incidence of disorders most prevalent among overweight persons. Approval and active support of the nation-wide effort is being given by the American Heart Association, the American Diabetes Association, and the American Dietetic Association. One medium by which the campaign will be carried to the public is an eight-minute animated motion picture film for theater use entitled "Cheers for Chubby." The film will be offered without rental charge to theaters throughout the country. A key activity of the campaign will be the distribution of a booklet, "Overweight and Underweight." Copies of the free booklet will be available to the public at each of the offices of the Metropolitan.

Research Foundation Director Appointed.—The Research Foundation, Chicago, a private, non-profit organization formed to produce and distribute in this country the vaccine BCG, has appointed Mr. Philip G. Rettig, Chicago attorney, as executive director. Mr. Rettig has resigned as director of research and legislation for the National Society for Crippled Children and Adults to accept the new appointment. Under his direction the foundation will continue research for greater perfection of the vaccine, expand distribution, and pursue an intensified educational program. About 60 million persons throughout the world have been innoculated with the vaccine, it is reported. At present 136 institutions in this country are using it. Continuing basic research toward improvement of the vaccine is being carried on by the University of Illinois. Gaylord Donnelley, Chicago industrialist, is president of the foundation at 26 E. Huron St., which is licensed by the National Institutes of Health as the distributor of the vaccine.

Society Elections.—At the annual meeting of the American Dermatological Association in Hot Springs, Va., Dr. Edward A. Oliver, Chicago, was elected president; Dr. Fred M. Jacobs, Pittsburgh, vice president, and Dr. Louis Brunsting, Rochester, Minn., secretary.——Dr. Thomas L. Tolan, Milwaukee, was elected president of the American Hearing Society, Washington, D. C., by its board of directors in Chicago, July 1. He is the 13th person to head the society, which was founded in 1919 by the late Dr. Wendell C. Phillips. He succeeds Dr. C. Stewart Nash, Rochester, N. Y., who has served since November, 1944. ——Newly elected officers serving during 1951 for the Society for Pediatric Research include Dr. Horace L. Hodes, New York, president; Dr. F. Howell Wright, Chicago, vice president, and Dr. Sydney S. Gellis, Boston, secretary-treasurer.——Officers for the coming year for the Association of Surgeons of the Southern Railway System include Dr. Edward T. Newell Jr., Chattanooga, Tenn., president, and Dr. J. Marsh Frere Sr., Chattanooga, recording secretary.

American Board of Obstetrics and Gynecology.—The annual meeting of the American Board of Obstetrics and Gynecology was held in New York May 10-16, at which time 248 candidates were certified, including two single certifications in gynecology. Changes made at the meeting include adoption of the following:

1. Effective Jan. 1, 1952, case reports from one's residency service shall not be more than five (5) in number.
2. Exchange residencies into other specialties cannot be permitted to subtract from the minimal requirement of three (3) years of training divided between obstetrics and gynecology.
3. Application for re-examination in Part II must be made by the candidate prior to Feb. 1 of any year.
4. A blank logbook entitled "Medical Officer's Professional Training Record" is obtainable from the office of the surgeon general. This record should be carefully kept and attested while in military service. The next scheduled examination (Part I), consisting of a written examination and review of case histories, for all candidates will be held in various cities of the United States and Canada on Feb. 1, 1952. Application for examination or re-examination must be made by the candidate prior to Nov. 1, 1951.

Dr. Paul Titus, 1015 Highland Building, Pittsburgh 6, was secretary of the board until his death on June 28.

American Leprosy Missions.—Sixty Protestant mission boards, operating through American Leprosy Missions, Inc., of 156 Fifth Ave., New York, will spend $535,917 this year on 148 colonies in 31 countries. The field covered by the missions takes in about 50,000 patients. Budgeting calls for the expenditure of $350,000 on food, clothing, and daily needs of resident patients plus salaries for doctors and superintendents; $170,000 for new hospitals, churches, schools, and homes, and $30,000 for drugs and medicines. The fund is to include $40,000 for three new colonies, one in the Belgian Congo and one in the Tanganyika region (both in Africa), and one in the Barrio Grande of Paraguay; $85,177 for 29 stations in India, and $33,400 for the Chiengmai colony in Thailand, the largest single unit. An emergency grant of $25,000 for China will be held in reserve "until political conditions permit the resumption of work in the colonies there." Asia as a whole will receive this year the benefit of $204,655, and Africa will receive $163,458. Other allocations cover $50,295 for South America, $5,828 for Europe, and $5,446 for North America. The American Leprosy Missions reported that only 2 or 3% of the estimated 10 million leprosy victims are receiving treatment in government or mission colonies.

Prevalence of Poliomyelitis.—The National Office of Vital Statistics reports that for the week ending July 7 a total of 407 cases of poliomyelitis was reported, which represents an increase of 19% over the previous week's figure of 341. For the same week last year, 478 cases were reported. The cumulative total since the seasonal low week is 2,026, as compared with 2,525 for the same period last year. No section of the country showed a marked increase in cases for the week as compared with the previous week.

Up to and including the week ended June 30, the incidence in Texas has been highest in Nueces and San Patricio counties, or about 30% of the cases reported in the state. Nearly half of the cases during this period occurred in Bexar, Harris, and Tarrant counties, all with large urban populations. In California there has been no great concentration of cases. In Louisiana 12 of the state's 30 cases during the week occurred in Shreveport. Prior to the first week of July, about one third of the cases were in the five counties in the extreme northwest part. In Oklahoma poliomyelitis cases were concentrated in Oklahoma and Garvin counties, and in Alabama nearly half the cases have been in Jefferson county.

States reporting more than 10 cases in the last two weeks are as follows:

	July 7, 1951	July 8, 1952		July 7, 1951	July 8, 1952
New York	17	29	Florida	10	8
New Jersey	5	16	Alabama	22	20
Illinois	16	19	Mississippi	17	8
Michigan	21	8	Tennessee	4	13
Wisconsin	12	6	Arkansas	15	13
Iowa	..	12	Louisiana	30	6
Nebraska	7	13	Oklahoma	21	26
Virginia	2	22	Texas	58	105
South Carolina	3	31	Colorado	21	..
Georgia	14	9	California	39	34

MEETINGS

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, The Homestead, Hot Springs, Va., Sept. 6-8. Dr. William F. Mengert, 2211 Oak Lawn Ave., Dallas, Texas, Secretary.

American Congress of Physical Medicine, Shirley-Savoy Hotel, Denver, Sept. 4-8. Dr. Walter J. Zeiter, 2020 E. 93d St., Cleveland 6, Executive Director.

Montana Medical Association, Great Falls, Sept. 13-16. Mr. L. R. Hegland, 104 N. Broadway, Billings, Executive Secretary.

National Medical Association, Philadelphia, Aug. 20-24. Dr. John T. Givens, 1108 Church Street, Norfolk 10, Va., General Secretary.

Nevada State Medical Association, Riverside Hotel, Reno, Sept. 13-15. Dr. Wesley W. Hall, 307 W. Sixth St., Reno, Secretary.

Post Graduate Medical Assembly of South Texas, Shamrock Hotel, Houston, Texas, July 23-25. Mrs. W. H. Dahme, 229 Medical Arts Bldg., Houston, Executive Secretary.

Reno Surgical Society Conference, Riverside Hotel, Reno, Nev., Aug. 23-25. Dr. Olin C. Moulton, 130 N. Virginia St., Reno, Nev., Chairman.

Rocky Mountain Radiological Society, Denver, Aug. 9-11. Dr. Maurice D. Frazer, 1037 Stuart Building, Lincoln, Nebr., Secretary.

U. S. Chapter, International College of Surgeons, Palmer House, Chicago, Sept. 10-14. Dr. Arnold S. Jackson, 1516 Lake Shore Drive, Chicago, Executive Secretary.

Utah State Medical Association, Salt Lake City, Sept. 13-15. Dr. T. C. Weggeland, 42 S. Fifth East St., Salt Lake City, Secretary.

Washington State Medical Association, Seattle, Sept. 9-12. Dr. James W. Haviland, 338 White-Henry-Stuart Bldg., Seattle, Secretary.

INTERNATIONAL

Association Internationale de Psychotechnique, Gothenburg, Sweden, July 24-28. Dr. Franziska Baumgarten-Tramer, Thunstrasse 35, Berne, Switzerland.

European Congress on Rheumatism, Barcelona, Spain, Sept. 24-27. Dr. Gunnar Edströn, Sweden, Secretary.

General Practitioners Study Club International, Rome, Italy, Sept. 12-15. Dr. John O'Connell, 10300 Lackland Road, St. Louis 14, Mo., U. S. A., President.

International Anesthesia Research Society, London, England, Sept. 3-7. Mr. R. W. Cope, University College Hospital, London W.C.1, England.

International Association of Allergists, Zurich, Switzerland, Sept. 23-29. Prof. A. S. Grumbach, Hygiene Institut der Universitaet Zurich, Gloriastr. 32, Zurich, Switzerland.

International Congress of Anesthesiology, Nursing School of the Salpiettre, 47 Boul de l'Hospital, Paris, France, Sept 20-22. 12 rue de Seine, Paris 6ᵉ, France, Secretariat.

International Congress on Entomology, Amsterdam, Holland, Aug. 17-24. Dr. J. de Wilde, 136 Rapenburgerstraat, Amsterdam, Secretary.

International Congress on Industrial Medicine, Instituto Superior Técnico, Lisbon, Portugal, Sept. 9-15. Dr. Luis Guerreiro, Instituto Nacional do Trabalho e Previdência, Praça do Comercio, Lisbon, Secretary General.

International Congress on Mental Health, Mexico City, Mexico, Dec. 11-19. Mrs. Grace E. O'Neill, Division of World Affairs, National Association on Mental Health, 1790 Broadway, New York 19, N. Y.

International Congress of Physical Medicine, London, England, July 14-19. Dr. A. C. Boyle, 45, Lincoln's Inn Fields, London, W.C.2, England, Honorary Secretary.

International Gerontological Congress, Hotel Jefferson, St. Louis, Mo., U. S. A., Sept. 9-14. Dr. John E. Kirk, 5600 Arsenal Street, St. Louis 9, Mo., Chairman, Program Committee.

International Poliomyelitis Congress, Copenhagen, Denmark, Sept. 3-7. Prof. Dr. Niels Bohr, Statens Seruminstitut, 80 Amager Blvd., Copenhagen S., Denmark, President.

International Society of Surgery, Paris, France, Sept. 24-29. Dr. L. Dejardin, 141, rue Belliard, Brussels, Belgium, Secretary General.

International Society for the Welfare of Cripples, Fifth World Congress, Stockholm, Sweden, Sept. 9-14. Mr. Donald V. Wilson, 54 E. 64th St., New York 21, N. Y., U. S. A., Executive Director.

Pan Pacific Surgical Association Congress, Honolulu, Hawaii, Nov. 7-19. Dr. Forrest J. Pinkerton, Suite 7, Young Bldg., Honolulu, Hawaii, President.

Students' International Clinical Congress, Leyden, Utrecht, Groningen and Amsterdam, Holland, July 10-28. N. A. M. Bergstein, Oude Gracht 143 bis, Utrecht, Holland, Secretary General.

World Confederation for Physicial Therapy, Copenhagen, Denmark, Sept. 7-8.

World Medical Association, Stockholm, Sweden, Sept. 15-21. Dr. Louis H. Bauer, 2 E. 103d St., New York 29, N. Y., U. S. A., Secretary-General.

EXAMINATIONS AND LICENSURE

BOARDS OF MEDICAL EXAMINERS

Arizona:* *Examination.* Phoenix, July 17-19. *Reciprocity.* Phoenix, July 21. Sec., Dr. J. H. Patterson, 316 W. McDowell Road, Phoenix.

California: *Written.* San Francisco, Aug. 20-23. *Oral.* Los Angeles, August 18. *Oral and Clinical Examination for Foreign Medical School Graduates.* Los Angeles, August 19. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

Colorado:* *Reciprocity.* Denver, July 10. Sec., Dr. George H. Gillen, 831 Republic Bldg., Denver 2.

Connecticut:* *Regular. Examination.* Hartford, July 10-11. Sec to the Board, Dr. Creighton Barker, 160 St. Ronan St., Hartford. *Homeopathic.* Derby, July 11-12. Sec., Dr. Donald A. Davis, 38 Elizabeth St., Derby.

Delaware: *Examination.* Dover, July 10-12. *Reciprocity.* Dover, July 19. Sec., Dr. J. S. McDaniel, 229 S. State St., Dover.

Georgia: Atlanta, June, August, Oct. 9-11. Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta.

Guam: The Commission on Licensure will meet whenever a candidate appears or submits his credentials. Ex. Sec., Dr. John Y. Battenfield, Agana.

Hawaii: *Examination.* Honolulu, July 9-12. Sec., Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.

Idaho: Boise, July 9-11. Sec., Mr. Armand L. Bird, 305 Sun Bldg., Boise.

Maine: Augusta, July 10-11. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

Massachusetts: *Examination.* Boston, July 10-13. Sec., Dr. Robert C. Cochrane, Room 37, State House, Boston 33.

Nevada:* Carson City, August 6. Sec., Dr. G. H. Ross, 112 North Curry St., Carson City.

New Hampshire: Concord, Sept. 12-13. Sec., Dr. John Samuel Wheeler, Room 107 State House, Concord.

New Mexico:* Santa Fe, Oct. 8-9. Sec., Dr. Charles J. McGoey, Coronado Bldg., Santa Fe.

North Carolina: *Reciprocity.* Morehead City, July 28. Sec., Dr. Joseph J. Combs, 419 Professional Bldg., Raleigh.

North Dakota: Grand Forks, July 4-7. Sec., Dr. C. J. Glaspel, Grafton.

Ohio: *Examination.* Columbus, December. *Reciprocity.* Columbus, Aug. 14 and Oct. 2. Sec., H. M. Platter, 21 W. Broad St., Columbus 15.

Oregon:* *Examination.* Portland, July 5-7. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland 4.

Pennsylvania: *Examination.* Philadelphia and Pittsburgh, July 10-13. *Acting Sec., Mrs. M. G. Steiner, 351 Education Bldg., Harrisburg.*

Puerto Rico: *Examination.* Santurce, Sept. 4. Sec., Mr. Luis Cueto Coll, Box 3717, Santurce.

Rhode Island:* *Examination.* Providence, July 5-6. Administrator of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., *Providence.*

South Dakota: Rapid City, July 17-18. Sec., Dr Clarence E. Sherwood, 109 Center St., West, Madison.

Texas:* *Reciprocity.* Marlin, Aug. 5. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Ft. Worth.

Utah: Salt Lake City, July 11-13. Asst. Dir., Mr. Frank E. Lees, 324 State Capitol Bldg., Salt Lake City 1.

Washington:* Seattle, July 16-18 Sec., Department of Licenses, Mr. Edward C. Dohm, Olympia.

West Virginia: Charleston, July 9-11. Sec., Dr N H. Dyer, Capitol Bldg., Charleston 5.

Wisconsin:* Milwaukee, *July 10-12.* Sec., Dr. C. A. Dawson, River Falls.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Alaska: Juneau, August. Sec., Dr. C. Earl Albrecht, Box 1931, Juneau.

District of Columbia: *Examination.* Washington, Oct. 22-23. Sec., Dr. Daniel L. Seckinger, 4130 E. Municipal Bldg., Washington.

Iowa: *Examination.* Des Moines, July 10. Sec., Dr. Ben H. Peterson, Coe College, Cedar Rapids.

Michigan: Detroit and Ann Arbor, Oct. 12-13. *Examination.* Sec., Miss Eloise LeBeau, 501 W. Michigan Ave., Lansing 15.

Minnesota: *Examination.* Minneapolis, Oct. 2-3. Sec., Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis.

Nebraska: *Examination.* Omaha, Oct. 2-3. Director, Bureau of Examining Boards, Mr. Oscar F. Humble, Room 1009, State Capitol Bldg., Lincoln 9.

Nevada: *Examination.* Reno, July 3. Sec., Mr. Frank Richardson, University of Nevada, Reno.

Oklahoma: Oklahoma City, Sept. 14. Sec., Dr. Frank C. Gallaher, 813 Braniff Bldg., Portland 4.

Oregon: *Examination.* Portland, Sept. 8 and Dec. 1. Sec., Dr. Charles D. Byrne, State Board of Higher Education, University of Oregon, Eugene.

Rhode Island: *Examination.* Providence, August 8. Administrator of Professional Regulation, Mr. Thomas B. *Casey, 366 State Office* Bldg., Providence.

Tennessee: *Examination.* Memphis, July 5-6. Sec., Dr. O. W. Hyman, 874 Union Ave., Memphis.

Texas: *Examination.* Austin, October. Chief Clerk, Mr. B. H. Kirk, 306 Nalle Bldg., Austin.

Washington: *Examination.* Seattle, July 11-12. Sec., Department of Licenses, Mr. Edward C. Dohm, Olympia.

Wisconsin: *Examination.* Madison, Sept. 22. Sec., Mr. W. H. Barber, Ripon College, Ripon.

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* Basic Science Certificate required.

DEATHS

Lull, Clifford Bell ⊕ Philadelphia; born in Scranton, Pa., Feb. 3, 1894; Jefferson Medical College of Philadelphia, 1915; clinical professor of obstetrics at his alma mater from 1941 to 1946; past president of the Philadelphia Obstetrical Society; fellow of the American College of Surgeons, International College of Surgeons, American Association of Obstetricians, Gynecologists and Abominal Surgeons and the Philadelphia College of Physicians; an associate examiner of the American Board of Obstetrics and Gynecology; chief of staff and director, division of obstetrics and gynecology, Philadelphia Lying-In Hospital; consulting gynecologist and obstetrician, Philadelphia General Hospital; author of "Management in Obstetric Complications" and co-author with Dr. Robert A. Hingson of "Control of Pain in Childbirth"; editor of "Clinical Obstetrics," now in the process of publication; a member of the editorial board of *Digest of Treatment;* died in Pennsylvania Hospital July 6, aged 57.

Decherd, George Michael Jr., ⊕ Austin, Texas; born in Austin, Texas, Dec. 19, 1906; University of Minnesota Medical School, Minneapolis, 1930; professor of internal medicine at the University of Texas Medical Branch in Galveston and director of the student health service at the University of Texas, Austin; at one time on the faculty of Tulane University of Louisiana School of Medicine in New Orleans; specialist certified by the American Board of Internal Medicine; member of the American Heart Association, Central Society of Clinical Research, Society of Experimental Biology in Medicine, American Public Health Association, and the American Society of Clinical Investigation; fellow of the American College of Physicians; chief of staff, Brackenridge Hospital; visiting physician, St. David's and Seton hospitals; died March 5, aged 44, of chronic lymphatic leukemia.

Cotton, Albertus ⊕ Baltimore; born in Marysville, Kan., Sept. 23, 1872; College of Physicians and Surgeons, Baltimore, 1896; professor emeritus of orthopedic surgery and roentgenology at the University of Maryland School of Medicine and College of Physicians and Surgeons; an Associate Fellow of the American Medical Association; specialist certified by the American Board of Orthopaedic Surgery and the American Board of Radiology; fellow of the American College of Surgeons; member of the American Roentgen Ray Society and the American College of Radiology; chief, orthopedic service, Mercy Hospital; attending orthopedic surgeon, James Lawrence Kernan Hospital and Industrial School for Crippled Children; affiliated with University, Presbyterian Eye, Ear and Throat, and Sydenham hospitals; died in Mercy Hospital May 3, aged 78, of nephrosclerosis with uremia.

Martin, Edward Gillette ⊕ Detroit; born Dec. 27, 1880; Detroit College of Medicine, 1904; emeritus professor of proctology at his alma mater, now known as the Wayne University College of Medicine; specialist certified by the American Board of Surgery and the American Board of Proctology, of which he had been one of the founders; member of the American Proctologic Society; fellow of the International College of Surgeons and the American College of Surgeons; served as president of the Wayne County Medical Society; proctologist, St. Mary's Hospital and Detroit Tuberculosis Sanatorium; consulting proctologist, Receiving, Harper, Grace, and Florence Crittenton hospitals in Detroit and the Highland Park General Hospital in Highland Park; an early editor of the *Detroit Medical News*; died in Harper Hospital May 11, aged 70, of coronary thrombosis.

Sutherland, Charles Goldie ⊕ Rochester, Minn.; born in Hamilton, Ont., Canada, June 19, 1877; University of Toronto Faculty of Medicine, Toronto, Canada, 1907; during World War I was an acting major in the Royal Army Medical Corps; entered the Mayo Clinic as first assistant in roentgenology in October 1918 and was appointed consultant in the section of roentgenology in July, 1923; assistant professor of radiology at the Mayo Foundation, serving until July 1942, when he became a member of the emeritus staff; an Associate Fellow of the American Medical Association; member of the American College of Radiology and the Minnesota Radiological Society; an honorary member of the Canadian Radiological Society; specialist certified by the American Board of Radiology; died in Colonial Hospital May 4, aged 73.

Burnap, Willard Lathrop ⊕ Fergus Falls, Minn.; born in Dover, N. H., Jan. 28, 1874; Rush Medical College, Chicago, 1901; past president of the Minnesota State Medical Association and councilor of the Eighth District; in 1944 awarded the distinguished service medal of the state association for his "professional accomplishments and for service to the profession in Minnesota"; member of the Radiological Society of North America; fellow of the American College of Surgeons; member of the House of Delegates of the American Medical Association in 1926, 1927, 1928, and 1950; instrumental in the creation of the Northern Minnesota Medical Association in 1920, serving as its secretary, general manager, and president; affiliated with Wright Memorial Hospital; died May 9, aged 77, of brain tumor.

Haygood, Charles Wendell, Shawnee, Okla.; born in Hanley, Texas, Oct. 17, 1909; University of Oklahoma School of Medicine, Oklahoma City, 1935; member of the American Medical Association; passed assistant surgeon of the U. S. Public Health Service Reserve from 1942 to 1946; on the staff of the city health department of Oklahoma City; served in the Oklahoma State Health Department; came to Shawnee as director of the City-County Health Unit and served from 1940 to 1946; partner in the Keen-Haygood Clinic; on the staff of the City Hospital; business manager of the *Bulletin of the Pottawattomie County Medical Society;* died in St. Anthony's Hospital, Oklahoma City, May 8, aged 41, of hypernephroma.

Johnson, William Joshua, San Antonio, Texas; born in Cookville, Texas, Feb. 9, 1883; Fort Worth School of Medicine, Medical Department of Texas Christian University, 1907; member of the American Medical Association; fellow of the American Psychiatric Association; specialist certified by the American Board of Psychiatry and Neurology; served on the staff of the North Texas State Hospital, Terrell; at one time superintendent of the East Texas State Hospital for Insane in Rusk and the State Hospital for Senile Insane in Austin; for many years superintendent of the San Antonio State Hospital; died in Nix Memorial Hospital March 6, aged 68, of gastric hemorrhage and peptic ulcer.

Rafferty, Theodore Newell, Sebring, Fla.; born in Robinson, Ill., April 21, 1908; University of Illinois College of Medicine, Chicago, 1933; fellow of the American College of Physicians; member of the American College of Chest Physicians, National Tuberculosis Association, and the American Trudeau Society; served on the staffs of Maybury Sanatorium, Northville, Mich., Veterans Administration Hospital, New Orleans, and the Eastern North Carolina Tuberculosis Sanatorium' in Wilson, N. C.; author of "Artificial Pneumothorax in Pulmonary Tuberculosis"; died in the Ochsner Foundation Hospital, New Orleans, April 8, aged 43, of subacute bacterial endocarditis.

Freeman, Benjamin Franklin, Grosse Pointe, Mich.; born in Waco, Texas, Nov. 18, 1896; Johns Hopkins University School of Medicine, Baltimore, 1922; member of the American Medical Association; fellow of the American College of Surgeons; served a residency at the City of Detroit Receiving Hospital; chief gynecologist at Saratoga General Hospital; member of the courtesy surgical staff, Highland Park General Hospital in Highland Park, and Harper Hospital, St. Joseph's Mercy Hospital, Woman's Hospital, and Grace Hospital, all in Detroit; died May 21, aged 54, of glioblastoma.

⊕ Indicates Fellow of the American Medical Association.

Abbott, Charles E., Minden, Neb.; Western University Faculty of Medicine, London, Ont., Canada, 1902; member of the American Medical Association, died April 30, aged 74, of coronary thrombosis.

Allen, Martin Sylvester, Elizabethtown, Ky.; Kentucky School of Medicine, Louisville, 1885; formerly health officer of Hardin County; died April 17, aged 90, of pulmonary hemorrhage, arteriosclerosis, and hypertrophy of the prostate.

Armstrong, Edward Cornelius, Sussex, N. J.; University of the City of New York Medical Department, New York, 1889; died May 2, aged 87, of arteriosclerosis.

Baron, Samuel Lincoln, Philadelphia; Temple University School of Medicine, Philadelphia, 1910; an examining physician for the Army during World War I; on the staffs of Jewish and Mount Sinai hospitals; died May 3, aged 65, of myocarditis.

Baumeister, Charles F., Avoca, Iowa; Marion-Sims College of Medicine, St. Louis, 1897; past president of Pottawattomie County Medical Society; on the staff of Jennie Edmundson Hospital in Council Bluffs for many years; member of the American Medical Association; died in Bishop Clarkson Hospital, Omaha, Neb., May 4, aged 78, of carcinoma of the lung.

Bloemendaal, Edwin Gerald John, Lake Park, Minn.; State University of Iowa College of Medicine, Iowa City, 1936; member of the American Medical Association; died in St. Mary's Hospital, Detroit Lakes, April 1, aged 40, of subarachnoid hemorrhage.

Bowman, Fred Arnold ⊕ Leon, Iowa; University of Louisville (Ky.) Medical Department, 1894; Keokuk Medical College, 1898; served as coroner of Decatur County, affiliated with Decatur County Hospital; died April 12, aged 79, of carcinoma of the prostate.

Boyce, Samuel George, Little Rock, Ark.; Western Eclectic College of Medicine and Surgery, Kansas City, Kan., 1909; served during World War I; died May 3, aged 63, of prostatic hypertrophy.

Bradley, John Martin ⊕ St. Louis; Washington University School of Medicine, St. Louis, 1901; an Associate Fellow of the American Medical Association; died in De Paul Hospital May 3, aged 78, of cerebral hemorrhage.

Brigham, Jeanette M., Pasadena, Calif.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1900; died in May, aged 76.

Britton, Roland L., Mays Landing, N. J.; College of Physicians and Surgeons, Baltimore, 1907; died March 1, aged 64, of coronary occlusion.

Bubna, Louis Edward, Cleveland; University of Rochester School of Medicine and Dentistry, Rochester, N. Y., 1932; served during World War II; on the staff of St. Alexis Hospital; physician for the Baltimore & Ohio Railroad; died May 2, aged 44, of a skull fracture received in a fall.

Buckman, Isaac, Doylestown, Pa.; Baltimore University School of Medicine, 1903; owner of a private hospital; died April 27, aged 74, of cerebral hemorrhage.

Burke, William Augustus, Brooklyn; Long Island College Hospital, Brooklyn, 1918; affiliated with Kings County, St. Peter's, and Holy Family hospitals; died May 9, aged 61.

Callerstrom, Gottfried William, Minneapolis; University of Minnesota College of Medicine and Surgery, Minneapolis, 1906; member of the American Medical Association; formerly deputy county coroner; on the staff of the Swedish Hospital; died May 6, aged 69, of coronary occlusion.

Copenhaver, Meek Marion ⊕ Knoxville, Tenn.; Tennessee Medical College, Knoxville, 1902; served during World War I; died May 3, aged 73, of coronary occlusion.

Cracroft, Thomas Byron, Asheville, N. C.; Medical Department of Tulane University of Louisiana, New Orleans, 1907; for many years affiliated with the Veterans Administration; died in Swannanoa May 5, aged 80, of lobar pneumonia.

Cutler, Franklin Earl, Wecoma Beach, Ore.; Cleveland Homeopathic Medical College, 1905; Jefferson Medical College of Philadelphia, 1906; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology and the American Laryngological, Rhinological and Otological Society; fellow of the American College of Surgeons; died in the Good Samaritan Hospital, Portland, Ore., March 30, aged 72, of cerebral hemorrhage.

Ford, William, Williamsport, Pa.; Jefferson Medical College of Philadelphia, 1914; for many years medical examiner for the Pennsylvania Railroad; died April 25, aged 65, of coronary occlusion and diabetes mellitus.

Gardner, Russell Wilson ⊕ Troy, Ohio; Ohio State University College of Medicine, Columbus, 1927; member of the American Society of Anesthesiologists; affiliated with Stouder Memorial Hospital; killed May 7, aged 53, in an automobile accident near Casper, Wyo.

Glenn, Robert Baltzell, Jacksonville, Fla.; University of Georgia School of Medicine, Augusta, 1941; member of the American Medical Association; served during World War II; died at sea, off Key West, April 25, aged 33, in an airplane accident.

Harned, John Wisdom, Hopkinsville, Ky.; University of Louisville Medical Department, 1897; member of the American Medical Association; on the staff of the Jennie Stuart Memorial Hospital; served on the local Selective Service Board during World War I and was reappointed during World War II; died April 22, aged 75, of dissecting aneurysm.

Henry, Frank Charles Jr. ⊕ Perth Amboy, N. J.; Cornell University Medical College, New York, 1921; fellow of the American College of Surgeons; director of surgery, Perth Amboy General Hospital; assistant surgeon, Roosevelt Hospital, Metuchen; consulting surgeon, New Jersey State Hospital, Marlboro, and South Amboy Memorial Hospital, South Amboy; died March 7, aged 54, as the result of an automobile accident.

Hilliard, Hercules C., Paducah, Ky.; Eclectic Medical Institute, Cincinnati, 1900; died March 15, aged 75.

Hunter, Edwin William, Greenwood, Miss.; Medical Department of Tulane University of Louisiana, New Orleans, 1901; died May 7, aged 81, of heart disease.

Irwin, Thaddeus Stevens, St. Petersburg, Fla.; Jefferson Medical College of Philadelphia, 1887; member of the American Medical Association and the Medical Society of the State of Pennsylvania; died April 12, aged 86, of arteriosclerosis.

Jorgenson, Milton Cyril ⊕ Watertown, S. D.; Northwestern University Medical School, Chicago, 1930; died April 5, aged 46, of lymphosarcoma.

Kloepper, Victor Ferdinand ⊕ St. Louis; Washington University School of Medicine, St. Louis, 1926; served during World War II; affiliated with Lutheran Hospital; died May 3, aged 50, of carcinoma of the pancreas.

Lander, William Tertius, Williamston, S. C.; Medical College of the State of South Carolina, Charleston, 1910; member of the American Medical Association and the American Trudeau Society; died May 15, aged 90, of heart disease.

Lawson, John Mack, Fort Worth, Texas; Baylor University College of Medicine, Dallas, 1934; member of the American Medical Association; fellow of the American College of Surgeons; on the staff of the Harris Memorial Methodist Hospital; died April 26, aged 41, of heart disease.

McAnerny, John Henry ⊕ Parsons, Tenn.; University of Tennessee College of Medicine, Memphis, 1933; died May 4, aged 44.

Macbeth, Harry Francis, Seattle; Milwaukee Medical College, 1904; died May 3, aged 68, of cerebral hemorrhage and cerebral arteriosclerosis.

McNabb, John Wilson ⊕ Louisa, Ky.; Medical College of Virginia, Richmond, 1923; served as president of the Lawrence County Medical Society; for many years president of the county board of health; died February 13, aged 55.

Martin, Robert Michael ⊕ Detroit; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1910; affiliated with Grace, Michigan Mutual, and Children's hospitals; died in Harper Hospital April 20, aged 65, of carcinoma of the bladder.

Murtaugh, Edward G., Burlingame, Kan.; University Medical College of Kansas City, 1898; county coroner; formerly affiliated with the Indian Service; died April 7, aged 83, of cerebral hemorrhage.

Nicholson, Richard Eugene, Brenham, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1897; member of the American Medical Association; fellow of the American College of Surgeons; veteran of the Spanish-American War; chairman of the board of directors of Farmers National Bank; affiliated with Sarah B. Milroy Memorial Hospital; died February 7, aged 76, of cerebral hemorrhage.

Nowers, Walter E., Long Beach, Calif., John A. Creighton Medical College, Omaha, 1908; member of the American Medical Association and the Nebraska State Medical Association; died in Long Beach, April 17, aged 69, of myocardial infarction.

Oberholtzer, Edward James, Williamsfield, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; died in Cottage Hospital, Galesburg, May 2, aged 72, of cirrhosis of the liver and diabetes mellitus.

Ogle, Clairel Leroy ⊕ Grants Pass, Ore.; Harvard Medical School, Boston, 1923; served during World War I; fellow of the American College of Surgeons; on the staff of Josephine General Hospital; died April 27, aged 57, of a compound fracture of the skull suffered in an automobile accident.

Owen, Albert Simpson, North Edgecomb, Maine; Tufts College Medical School, Boston, 1911; served with the army on the Mexican border in 1914; awarded the Croix de Guerre by the French government for his service during World War I; at one time a member of the board of education in Framingham, Mass., and on the staff of Bath Memorial Hospital in Bath; died May 4, aged 66, of coronary heart disease.

Paul, Samuel George, Salt Lake City; University of Pennsylvania Department of Medicine, Philadelphia, 1901; member of the American Medical Association; served as city health commissioner; for many years school physician; formerly chairman of the county board of health and police surgeon; affiliated with St. Mark's Hospital; died April 20, aged 74, of tuberculosis.

Pierce, Eben Douglas, Trempealeau, Wis.; University of Oregon Medical School, Portland, 1899; died May 3, aged 76, of carcinoma of the colon.

Price, Norman Wellington, Niagara Falls, N. Y.; University of Toronto Faculty of Medicine, Toronto, Canada, 1896; member of the American Medical Association and the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; on the staffs of St. Mary's Hospital and Memorial Hospital, where he died April 18, aged 82, of myocardial infarction.

Quillian, Edgar Pierce, Clyattville, Ga.; St. Louis College of Physicians and Surgeons, 1899; member of the American Medical Association; died in Thomasville May 2, aged 73.

Rand, Morris ⊕ Los Angeles; Baltimore Medical College, 1911; died April 8, aged 69.

Ray, Frank Leonard ⊕ Charlotte, N. C.; Medical College of Virginia, Richmond, 1919; member of the American Medical Association; served during World War I; died April 23, aged 56, of arteriosclerotic heart disease.

Reed, Josiah Frederick, Harrisburg, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1918; past president of the Dauphin County Medical Society; fellow of the American College of Surgeons; served during World War I; died in Jackson Memorial Hospital, Miami, Fla., April 25, aged 60, of adenocarcinoma of the bladder.

Richardson, Everett Wesley, Winslow, Ind.; Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1906; died March 7, aged 73, of coronary thrombosis.

Robinson, Burton Lowry, Edna, Texas; University of Tennessee College of Medicine, Memphis, 1944; served during World War II; died in Meridian, Miss., May 4, aged 30, of cerebral hemorrhage.

Robinson, Dana E. ⊕ Medical Director, U. S. Public Health Service, retired, Los Angeles; Medical College of Ohio, Cincinnati, 1896; died May 5, aged 76, of hypertensive heart disease and arteriosclerosis.

Roth, Jesse Henry, Tucson, Ariz.; University of Illinois College of Medicine, Chicago, 1915; specialist certified by the American Board of Otolaryngology; formerly practiced in Kankakee, Ill., and was past president of the Kankakee County Medical Society; formerly practiced in Jamestown, N. D., where he was on the staffs of Jamestown and Trinity hospitals; served during World Wars I and II; died May 1, aged 62.

Scarborough, James Warren, Terrell, Texas; St. Louis College of Physicians and Surgeons, 1917; member of the American Medical Association; for many years affiliated with Terrell State Hospital; died in Brackenridge Hospital, Austin, April 21, aged 76, of cardiac failure.

Schetky, Martha G. K., Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1897; died May 11, aged 81.

Schlosser, Charles Louis, Syracuse, N. Y.; Syracuse University College of Medicine, 1913; for many years medical examiner for the Metropolitan Life Insurance Company; died May 1, aged 70, of arteriosclerotic heart disease.

Sears, Clarence William, Youngstown, Ohio; State University of Iowa College of Medicine, Iowa City, 1932; member of the American Medical Association; served during World War II; died April 30, aged 44, of an accidental gunshot wound.

Shimer, Floyd Aaron, Phillipsburg, N. J.; Medico-Chirurgical College of Philadelphia, 1905; also a graduate in pharmacy; a trustee of Warren Hospital, where he died April 21, aged 70, of chronic nephritis and uremia.

Sibert, Aldo Vernon, West Palm Beach, Fla.; Ohio State University College of Medicine, Columbus, 1915; died April 24, aged 58, of heart disease.

Simkins, Raymond ⊕ Bridgeton, N. J.; Jefferson Medical College of Philadelphia, 1915; an Associate Fellow of the American Medical Association; died April 24, aged 72, of coronary insufficiency and arteriosclerosis.

Smith, Festus Steely, Corbin, Ky.; Hospital College of Medicine, Louisville, 1905; member of the American Medical Association; owner of Smith Hospital; died in Fort Lauderdale, Fla., April 8, aged 71.

Stern, Hyman Bernard, Philadelphia; Medico-Chirurgical College of Philadelphia, 1908; died in Jewish Hospital April 13, aged 65, of cerebral hemorrhage.

Sweet, Austin Dryden, Martinsville, Ind.; Indiana University School of Medicine, Indianapolis, 1923; member of the American Medical Association; served during World War I; for two terms county coroner; died in the Veterans Administration Hospital, Indianapolis, April 22, aged 56.

Taussig, Joseph Bondi, St. Louis; Washington University School of Medicine, St. Louis, 1931; member of the American Medical Association; served during World War II; on the staffs of the Veterans Administration Hospital in Jefferson Barracks, Mo., and Jewish Hospital, where he died May 8, aged 46, of cerebral hemorrhage.

Willis, Benjamin Coleman ⊕ Cincinnati; University of Virginia Department of Medicine, Charlottesville, 1902; affiliated with Christ Hospital; died April 15, aged 73, of heart disease.

Wilson, Homer Smith, Saugus, Calif.; University of Michigan Homeopathic Medical School, Ann Arbor, 1908; member of the American Medical Association; died May 1, aged 68.

Woods, Samuel D. E. ⊕ Osawatomie, Kan.; Hahnemann Medical College of the Kansas City University, Kansas City, Mo., 1902; on the staff of State Hospital, where he had been superintendent for many years; died April 2, aged 73, of arteriosclerosis, diffuse pulmonary fibrosis and myocarditis.

GOVERNMENT SERVICES

DEPARTMENT OF DEFENSE

Appointments of Drs. Blake and Spencer.—Dr. Francis G. Blake, Sterling Professor of Medicine at Yale University School of Medicine, has been appointed scientific director, Medical Research and Development Board, Office of the Army Surgeon General. Dr. Blake recently resigned the chairmanship of the committee on medical sciences, Research and Development Board, Department of Defense. His new position is the most responsible civilian post in medical research in the Army. He will assist in planning and supervising the Army Medical Service research and development program, of which over 200 projects already are under way. On the Yale faculty since 1920, Dr. Blake was dean of medicine from 1940 to 1947. During World War II he served in a civilian capacity as consultant to the secretary of war and, beginning in 1941, for five years as a member of the board of investigation of epidemic diseases in the U. S. Army.

Dr. Thomas B. Spencer has been appointed executive director of the committee on medical sciences, Research and Development Board, Department of Defense, succeeding Dr. Joseph M. Pisani, who will become assistant dean and instructor in medicine of the State University Medical Center at New York City. Dr. Spencer has served as deputy executive director of the committee since Aug. 1, 1950. Prior to that he was in private practice in Rochester, N. Y., and held staff appointments at Strong Memorial Hospital, Genesee Hospital, and Rochester General Hospital. Since September, 1950, he has been an instructor in clinical medicine at George Washington University.

Dr. Albert Rives Shands Jr., surgeon-in-chief of the Alfred I. duPont Institute of Wilmington, Del., has been appointed a member of the Armed Forces Medical Policy Council succeeding Dr. W. Randolph Lovelace II, who has been appointed chairman of the Council.

VETERANS ADMINISTRATION

Physicians Wanted.—The Veterans Administration Hospital, Downey, Ill., has vacancies for several physicians in the 217-bed tuberculosis unit of the hospital, as well as for an internist in the general medical unit. Salaries for the positions are determined by the experience and qualifications of the applicant. The salary range for physicians in the department of medicine and surgery includes: junior grade, $5,000 per year; associate grade, $5,400 per year; full grade, $6,400 per year; intermediate grade, $7,600 per year; senior grade, $8,800 per year, and chief grade, $10,000 per year. An additional allowance of 25% of the base salary is given those having a rating of specialist as approved by an American specialty board. Determination of the appropriate grade for applicants will be made by thorough evaluation of qualifications by a professional standards board. Promotions are available after meeting length of service and other requirements of the Veterans Administration. In addition, physicians are granted 30 days vacation and 15 days sick leave each year. Applicants should write to the Veterans Administration Hospital, Downey, Ill. The hospital is 35 miles north of Chicago, and five miles south of Waukegan, Ill.

New Hospital Managers.—The Veterans Administration has announced the appointment of new managers for three of its hospitals. The new managers are Dr. Edward S. Post, for the hospital in Sheridan, Wyo.; Dr. George S. Littell, for the Dallas, Texas, hospital, and Dr. Morris C. Thomas, for the hospital soon to be completed in Madison, Wis. Dr. Post, formerly manager of the VA hospital in Fort Custer, Mich., has moved to Sheridan to replace Dr. Victor H. Bean, who has been transferred to the Alexandria, La., hospital. Dr. Littell replaces Dr. Frederick R. Eastland, who recently resigned. Dr. Thomas presently is manager of the Waukesha, Wis. hospital.

Appoint Two Consultants.—The Veterans Administration has announced the appointment of two physicians to fill long-time vacancies on the Board of Chief Consultants. They are Dr. Charles L. Brown of Philadelphia, head of the department of medicine at Temple University and Hahnemann Medical School, and Dr. Charles E. Kossmann, associate professor of medicine at New York University. Dr. Brown was appointed chief consultant in internal medicine, and Dr. Kossmann received his appointment for cardiology. Both men were selected from a list of specialists submitted by the Board of Chief Consultants at its recent meeting in Washington, D. C.

PUBLIC HEALTH SERVICE

Experimental Thyroid Cancers.—Harold P. Morris, biochemist at the National Cancer Institute of the Public Health Service, has been awarded the second prize in competition for the 1951 Van Meter prize awarded by the American Goiter Association. The award was made for a paper reporting that for the first time experimental cancers of the thyroid gland have been produced in animals. The cancers are transplantable to normal animals. The report is based on studies in progress at the institute for more than six years.

The first step in producing the experimental tumors is to block the secretion of the thyroid gland by adding a small amount of thiouracil to the animal's diet. The resultant thyroid deficiency causes an increase in the secretion of the hormone thyrotropin by the pituitary gland. Over-secretion of this hormone is thought to be accompanied by the under-secretion of other hormones, another unbalancing factor. Continuance of imbalance over a long period ends in malignancy. This tumor is thought to be caused by the prolonged stimulation of thyroid tissue by the thyrotropic hormone.

The discovery is a major advance in the laboratory attack on problems of thyroid cancer, according to Dr. John R. Heller, director of the National Cancer Institute. The possibility of a similarity between thyroid tumors in the mouse and those in humans, which was suggested by these experiments, has resulted in a new phase of thyroid tumor research at the National Cancer Institute. Exploratory studies in this field have found that some of the mouse thyroid tumors behave much like human thyroid tumors in that some have low ability to pick up radioactive iodine, and others show a high attraction for it. This finding makes possible studies to determine which factors influence the ability of thyroid tumors to concentrate administered radioactive iodine.

Venereal Disease Clinics.—The new Directory of Venereal Disease Clinics published by the U. S. Public Health Service carries summaries of prenatal and premarital laws, names and addresses of each diagnostic and treatment facility, and lists of laboratory facilities of each state, Marine hospitals, and facilities for American seamen.

There are 2,267 public venereal disease clinics in the United States and territories of Alaska, Hawaii, and Puerto Rico. North Carolina leads all other states, with 222 venereal disease clinics; Mississippi has 176; Georgia, 155; Pennsylvania, 139; Florida, 131; California, 118; Kentucky, 106; Texas, 101; South Carolina, 97, and Louisiana, 93. All other states have fewer than 90 clinics. These facilities were reported by the states and territories to the Public Health Service as of November, 1950.

The directory also shows that 42 states have prenatal laws requiring blood tests, and 41 states have premarital laws requiring blood tests and physical examinations for venereal disease. States not having prenatal laws are Alabama, Maryland, Minnesota, Mississippi, Tennessee, Wisconsin, and the District of Columbia. Arizona, Maryland, Minnesota, Mississippi, Nevada, New Mexico, Texas, and the District of Columbia do not have premarital laws. Alaska and Hawaii have both premarital and prenatal laws. Puerto Rico does not have either law, as such, but there is space on each "Certificado de Matrimonio" for a physician to state that applicants do not have mental disease, epilepsy, or syphilis.

FOREIGN LETTERS

LONDON

Royal Cancer Hospital Centenary.—The centenary of the Royal Cancer Hospital of London was celebrated on May 17, 1951. There was a reception at the hospital and demonstrations in the Chester Beatty Research Institute. At the centenary dinner, the chairman of the hospital board, Sir Edward Cripps, read a message from the King, congratulating the hospital on its great work during the hundred years of its existence and wishing it continued success.

Sir Henry Dale spoke of Dr. William Marsden, who founded the hospital at Hollywood Rd., West Brompton, after his wife died of cancer. It was later moved to its present site in Fulham Rd. It was the first hospital to deal solely with cancer. Sir Henry spoke of the lack of encouragement the hospital received in early days, as others did not altogether approve of a charitable hospital for one disease, but the founders persisted with their "courageous enterprise," their efforts being rewarded by a magnificent record for the hospital during the ensuing years. The speaker also thought it fit that the centenary of this hospital should fall in the Festival Year. Many scientific discoveries had been made since the 1851 exhibition; not all of them, unfortunately, had been used to further medical science, but there were many scientific advances made during the urgency of war which were subsequently adapted for human use.

Lord Horder, consulting physician to the hospital, speaking as the oldest member of the staff, recalled personalities of the past with whom he had been associated in his work. He pointed out the immense contributions to medical knowledge that had been made by special hospitals.

Mr. Oliver Lyttelton, president of the hospital, paid tribute to the work of the medical profession. He was glad that research institutions did not come under the control of the National Health Service, saying how essential it was that they should remain free of government control. With such control, there came inevitably a tendency to uniformity, followed closely by mediocrity. In no profession was uniformity more inappropriate than in medicine.

Mr. Hilary Marquand, Minister of Health, said the Royal Cancer Hospital was an institution of which the country and the commonwealth could be proud. Its change in ownership with the institution of the National Health Service brought no change in the purpose of the hospital's work. He was pleased that a film was being prepared to bring to public attention the dangers of cancer, the purpose of this film being to reassure, not to terrify, and to enable early diagnosis to be made. Cancer, he said, was the deadliest of foes and a challenge to all concerned in finding it, and the hospital could be proud of the hundred years spent in attempting to overcome the disease.

Demonstrations at the Chester Beatty Research Institute illustrated the contributions of various sciences to cancer research. In cytology, the effect of radiation and various chemicals on cell structures was shown. Methods of study of the cell by means of ultraviolet micrography and microspectography, phase-contrast micrography, cinemicrography, and electron micrography were exhibited.

There were other demonstrations, which included the preservation of chick tumor viruses by freeze-drying, electrophoretic diffusion studies, and biochemistry of tumors and of carcinogenetic and radiomimetric substances. There was also a historical section, illustrating the earlier experiments on carcinogenesis, and in the institute library many original papers were on display.

Burlington House.—It used to be the duty of one of the early members of the Royal Society to devise a new experiment each week for demonstration to the assembled fellows. Nearly three centuries have passed since then, and science has become infinitely more complicated and scientists "devilishly sophisticated." These facts are reported by the *British Medical Journal* of June 2, 1951, in an annotation about the Annual Evening Party *conversazione* held at Burlington House. The demonstration for this year consisted of about 30 exhibits conveyed in a straightforward manner and their inventors were at hand to explain their work in simple language. Several concerned the sea, one for instance showing how the deep sea floor can be bored for samples and analyzed to reveal a million years of the earth's history. Another took a series of flashlight photographs of the sea bottom at a depth of 150 ft. The annotation calls it a kind of marine census.

Other maritime exhibitions were contained in tanks, for example, hermit crabs in transparent shells, pink and greenish shrimps, long feathery worms, and a sleepy octopus. There was also a transparent, slowly turning wheel, containing sea water and many tiny shell fish. This apparatus was used for measuring swimming speeds and changes induced in them by the passage of day into night. One exhibit displayed the skulls of South African ape men, whose brows were ridged and whose massive jaws contained carious teeth. These were the skulls of men dead for a million years. There was also an impression in stone of the skin of a dinosaur. Some films were shown of snakes and the treatment of snake bite, and how spermatozoa and red cells may be kept at a temperature of 79 C. in the presence of glycerin.

This is a rare display even for London, showing as it does living animals and apparatus used on the very frontiers of research. Unfortunately, the *conversazione* was confined to fellows of the Royal Society and their guests. The *British Medical Journal* expresses regret that such demonstrations, having been shown at the Royal Society, cannot be made available to the general public and even brought to the country in the form of a traveling show. Appropriate ministerial departments, it is suggested, could well afford to finance such an undertaking. There is the continual risk that science should appear too remote and theoretical to the man in the street, but public experiments performed as they were in the day of Pepys can do much to further public knowledge of Science.

Barber-Surgeons.—In the *British Medical Journal* Supplement of June 2, 1951, Dr. A. K. P. Tobin says that the trade or profession of barber-surgeons, a flourishing one some two or three centuries ago, was put out of existence when the law forbade the practice of its more enterprising members of relieving their patients of varying quantities of blood, thus severing the connection between tonsorial and medical practitioners. The correspondent draws a present day analogy between these two forms of art. The barber, or hairdresser, charges 21 cents per head per haircut, and this operation can be repeated at a minimum of monthly intervals, thus giving the barber an annual capitation fee of $2.50 at least, as this does not include tips. The correspondent's hairdresser can average five haircuts an hour, thus controlling a panel of 1,000 clients, working 48 hours a week for a 50-week year. The family doctor, working 48 hours a week in a semirural area, cannot hope properly to look after more than 1,500 patients. The "looking after" includes night calls, unremunerated overtime and interrupted Sundays. Overhead expenses also are much heavier, and the responsibility, of course, is much greater.

The correspondent's conclusion is that, by balancing tips and quick sales, on the one hand, with maternity and special examination fees, on the other, the net incomes are similar in the two cases. He concludes with the pious hope that the Ministry of Health will not exploit too long the love of medical men and women for their calling.

Taking the Cure.—The *Lancet* of May 26, 1951, reports the findings of the British Medical Association Sponsor Committee, under the chairmanship of Lord Horder, on the place of the spa in modern practice. The report is in the form of a guide on all the spas in Great Britain, giving information with regard to the various forms of treatment at each spa. The committee is of the opinion that spa treatment can be of great value in chronic arthritis of rheumatoid and degenerative types. The rheumatism

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The items in these letters are contributed by regular correspondents in the various foreign countries.

that affects muscles and fasciae and the fibrositic type generally can also be relieved. Other conditions believed by the committee to benefit by spa treatment are inflammation of the urinary tract and pelvic disorders in women. The committee believes that spas could play a greater part in the convalescent treatment of both surgical and medical patients.

The committee feels that the profession tends to underestimate the value of spas and fails to appreciate the progress made at these centers in recent years. Closer cooperation among spa hospitals, universities, and teaching hospitals would promote research and insure greater continuity of treatment, standardized investigations, and follow-up. If this cooperation came about, spa treatment would then take its proper place in the National Health Service.

DENMARK

Cortisone and ACTH.—The organ of the Danish Medical Association, *Ugeskrift for Laeger,* reviews the present position in Denmark with regard to cortisone and corticotrophin (ACTH). Remarkably good results have been achieved in cases of rheumatic fever, the temperature and swelling of the joints subsiding in a day or two and symptoms referable to the heart disappearing quickly. Diseases of the eye, such as iridocyclitis and keratitis, and diseases of the skin, such as malignant pemphigus, have responded dramatically, and it has been found that the local instillation of cortisone gives satisfactory results in diseases of the eye. The supply of cortisone being very limited, its use has hitherto been largely reserved for experimental work. The situation is better with regard to corticotrophin, which since the autumn of 1949 has been available from home sources. Denmark, being a great exporter of bacon, should be able to produce large quantities of corticotrophin from the pituitary glands of pigs, and the highly developed chemical industry should ultimately succeed in producing well-standardized preparations of corticotrophin. Meanwhile the supplies of cortisone and corticotrophin now available are so small that they cannot meet the needs of even a small fraction of the patients anxious to give them a trial. The number of those who have been able to derive benefit of many months' duration under prolonged treatment is still rather small.

Index Medicus Danicus.—Up to 1912, the University Library in Copenhagen collected Danish medical publications in typewritten sheets under the heading *Bibliotheca Medica Danica.* Between 1913 and 1927 a card index was kept of Danish medical publications under the heading *Index Medicus Danicus.* After 1928, Drachmann undertook the editing of this work, which he continued for 22 years, to the end of 1949, in card index form. Now this form, accurate but rather cumbersome, has been replaced by the printed word. Four numbers of this new publication are to appear every year, and the subscription for a year is 25 Danish crowns. The *Index* groups Danish medical publications under such headings as medicine, surgery, and pediatrics, and provision is made for cross references when, for example, a fibroma of the ovary comes under the headings of both tumors and gynecology. The output of Danish medical publications is now so great and their standard so high that this *Index* is certain to prove increasingly valuable.

Effects of Tonsillectomy on Children.—A follow-up study of children undergoing tonsillectomy has recently been undertaken by Dr. Boy Kromann and Dr. Preben Eilersen at a children's hospital (Dronning Louises Börnehospital) where this operation was performed on 450 children during the five-year period 1945-1949. The indications for tonsillectomy were (1) repeated attacks of acute febrile tonsillitis, (2) chronic tonsillitis with or without signs of dyspepsia, (3) tonsillitis associated with involvement of the kidneys, heart, or joints, as well as chorea, (4) presence of mechanical interference with speech, respiration, or swallowing, and (5) presence of conditions such as colic and enuresis which might be connected with recurrent tonsillitis. Mere hypertrophy of the tonsils was not an indication for tonsillectomy. Almost all the patients belonged to the first two categories. The dyspepsia in the second category usually took the form of recurrent attacks of malodorous diarrhea associated with anorexia and a poor general condition.

The follow-up study was undertaken three to 48 months after the operation, and care was taken to make a searching examination of the patients in the hospital. Altogether 217 children were examined after an average interval of about two years. The ages of these 217 children ranged from 2 to 15 years, and all of them had suffered from recurrent infections of the throat; 44 had also suffered from the dyspeptic symptoms already referred to. It was found that the catarrhal symptoms had vanished in 71% and the dyspeptic symptoms in 75% of the children. In no case had conditions grown worse since the operation. Dr. Kromann and Dr. Eilersen find tonsillectomy to be a useful remedy for dyspeptic disturbances combined with recurrent infections of the throat in childhood.

Food Poisoning Due to Bacillus Cereus.—In 1950 a veterinary surgeon, St. Hauge of Oslo, published a preliminary account of outbreaks of food poisoning due, in his opinion, to a hitherto overlooked germ, Bacillus cereus. His observations have lately been confirmed by his Danish colleagues O. Christiansen, Svend O. Koch, and P. Madelung, who report on an outbreak of food poisoning in a summer camp near Aarhus in Denmark. The symptoms were colic, nausea, and diarrhea without fever or any severe general disturbance. An investigation led to exoneration of the water and milk supply, and the peccant article of food proved to be a yellow pudding from which Bacillus cereus was isolated in pure culture. Most of the pudding had been prepared on the day before it was eaten, and it had been kept at temperature calculated to promote the growth of this organism. Fifteen of the 18 adults and 106 of the 130 children between the ages of 8 and 16 who had eaten this pudding fell ill. Pathogenic intestinal bacteria were not found in the feces. In the Norwegian outbreaks, also, stool examinations yielded little information.

TURKEY

Urinary Schistosomiasis.—When Syria and Iraq were part of the Turkish empire, many of the inhabitants of these provinces were treated for schistosomiasis in the government and municipal hospitals. The disease is rare in the present boundaries of Turkey. Isolated cases of schistosomiasis are occasionally seen in Istanbul, Ankara, and Izmir hospitals, but the disease has invariably been contracted in Syria, Iraq, or Saudi Arabia. In August, 1950, the Ministry of Health and Social Assistance appointed parasitologist and entomologist Dr. Mahmut Sabit Akalin, director of the School of Hygiene, Dr. Kemal Alpay, director of malaria control work of the Mardin region, and Dr. V. M. Yavuz Engin, of the Refik Saydam Institute of Hygiene, to make inquiries concerning schistosomiasis in the southern provinces of Mardin and Urfa, which border on Syria and Iraq. After conferring at the border with Dr. Rushdi Tarazi, director general of hygiene for Syria, and Dr. Abdel Halim Alemi, director of health at Damascus and chief of the Bilharzia division of the Ministry of Health, the mission concentrated on the villages along the Mardin-Nusaybin border and especially on the Tel-Abiad and Kubour El Bid Syrian regions; investigation revealed that 60 to 70% of the rural population were affected. Careful examination of hundreds of persons in Turkish villages revealed that a few cases of hematuria existed there; clinical and microscopic examination revealed the presence of Schistosoma hematobium. These patients formerly lived or visited in Syria and had contracted the disease there. Many brooks and streams that have their source in Turkish territory flow into Syria. Every kind of snail found in Turkish fresh waters has been examined; Schistosoma hematobium hosts, Bulinus contortus, were not found in these waters, though a great many were found in the same waters of the Syrian territory. The Sublag and Djerrahi brooks had many other kinds of mollusks. Bifid-tailed cercariae were found in the waters of Syrian territory but not in Turkish territory. Snails from both territories were left in experimental tubes with drinking water; the Syrian tubes later exhibited Bulinus contortus and Miracidia, which were absent in the Turkish tubes.

Dr. Abdel Azim Bey, director of rural hygiene at the Ministry of Public Health, Cairo, Egypt, who on behalf of the World Health Organization as expert consultant investigated schistosomiasis in the Middle East, confirmed that 60 to 70% of the inhabitants of the Tel-Abiad and Kubour El Bid regions were infected with Schistosoma hematobium, that urinary schistosomiasis is endemic in the rural communities of southern Iraq around lake Khors and around the waters it receives, and that in northern Iraq isolated cases of schistosomiasis are encountered. Dr. Abdel Azim Bey pointed to the potential danger of the presence of fresh water snails in the rain water of swamps and streams in western Saudi Arabia in the regions of Taif, south of the holy city of Mecca. Schistosomiasis also exists among the workmen of the Saudi Arabian oil industry at the Persian gulf, where 22 of 25 school children examined were found to be infected. Investigation revealed that the disease is endemic in eastern Saudi Arabia, where the fresh waters harbor a great many snails.

Phytobezoar.—A phytobezoar was removed by Dr. Faruk Tuzener, chief at the surgical department of the Tokat government hospital. The patient was a 15 year old shepherd boy. He complained of a swollen abdomen, pain in the stomach, fainting, and epileptic fits. Six months before his admission to the hospital a doctor had administered santonin, and the patient passed 35 ascarides, which resulted in relief from pain for a month. Then the pain in the stomach, vomiting, and fainting recurred. The patient had a good appetite but was afraid to eat and lost weight. Significant findings at the time of admission were limited to the abdomen, which was greatly distended; a large, firm, mobile foreign body, with a rough surface and the size of a fist, was palpated. Generalized tenderness was present. The liver, spleen, and kidneys were in normal position. Exploratory laparotomy revealed a greatly distended stomach of normal color and maturity, with slightly thickened walls and a mobile mesogastrium. A firm, mobile foreign body in the stomach was palpated; gastrotomy was performed and a phytobezoar removed. It was oval and firm, weighed 320 gm., and consisted of a fermented mass of gray-green fiber and fruit rind.

THE PHILIPPINE ISLANDS

Physician Population.—There are about 6,900 physicians in the Philippine Islands, which has a population of 19,000,000. About one-third of the physicians reside in the capital, Manila, a city of over 1,000,000 population. The country has three schools of medicine, located in Manila; one is government owned, and the other two, including the well-known University of Santo Tomas, which was founded in 1619 by the Spaniards, are privately owned. A considerable number of the leading physicians here had their postgraduate training in universities in the United States.

Third Health Officers' Convention.—The third postwar Health Officers' Convention was held in Manila April 23-30, under the auspices of the bureau of health. The district health officers of some 53 provinces, 26 city health officers, and many physicians and dentists from all over the islands attended. The program included many refresher demonstrations in various medical activities, chiefly in the field of public health. Dr. Felipe Arenas, director of the bureau of health, and Dr. Mariano Icasiano, president of the League of District and City Health Officers, were the chief organizers. They received effective support from the secretary of health, Dr. Juan Salcedo Jr.

First South East Asia Medical Conference.—The first South East Asia Medical Conference was held simultaneously with the 44th Philippine Medical Association Convention. Dr. Abdul Kadir, delegate of Indonesia; Dr. Lim Uy Tao, from Nationalist China; Dr. Thongplensou, from Thailand; Dr. Francisco Roque, from the U. S. Public Health Service, and Dr. Carlos Ferrufino, delegate of the World Health Organization, Western Pacific Regional Office, attended this conference, which was organized by the Philippine Medical Association. Probably because of the economic and political instability in the majority of the Asiatic countries, many of them did not send delegates, therefore, this conference's achievements were limited. The Philippine delegate, explaining why this conference was called, said, among other things, "It is not safe to confine one's self solely to the medical problems of a country. . . . the medical problems now must be solved by countries of one geographical section. A sick man in Siam can be taken to Manila in a day, and a man with an infectious disease in Manila can be transferred to Djakarta in eight hours."

Thailand, the Philippines, and Indonesia were appointed members of a committee that will outline the plans for establishment of a South East Asia Medical Organization; the committee will consult the other countries and prepare for a convention at an early date. The World Health Organization delegate enthusiastically supported the establishment of such a medical organization and offered whatever facilities that W.H.O. might have for this purpose.

Forty-Fourth Annual Convention of the Philippine Medical Association.—Founded in 1903, the Philippine Medical Association had held its annual conventions regularly, except during World War II. The 44th convention was held May 1-6 at the University of Santo Tomas. Tuberculosis and malnutrition appeared to be the main public health problems of the Archipelago. Dr. Salcedo, director of the Institute of Nutrition and secretary of health, presented a sound plan for the fight against malnutrition. Dr. Rodolfo Gonzalez, the outgoing president of the Philippine Medical Association, emphasized the "vital problems facing medical education practice." In the closing General Session, Dr. Eugenio Alonso was installed as the new president.

BRAZIL

Nontuberculous Pulmonary Diseases and Incapacity to Work.—Drs. Durval Amorim, Ayrton Laroca, and Carlos Santos, of the Instituto dos Empregados em Transportes, an institution devoted to provide medical care, retirement, and pensions for the 135,000 workers of the transportation services of the state of São Paulo, published an analysis of the records of 2,000 successive medical examinations of applicants for compensation for incapacity to work, with special emphasis on nontuberculous pulmonary diseases. Of the 2,000 patients, 263 (13.16%) had diseases of the respiratory tract, distributed as follows: pulmonary tuberculosis, 156 (7.80% of the total); chronic bronchitis, 25 (1.25%); emphysema and pulmonary fibrosis, 24 (1.20%); bronchial asthma, 17 (0.85%); exudative pleuritis, 12 (0.60%); lobar pneumonia, 9 (0.45%); acute bronchitis, pneumonia, and bronchopneumonia, 7 (0.35%); pulmonary suppuration, 5 (0.25%); pulmonary blastomycosis and cancer, 2 each (0.10% each), and pneumoconiosis, bronchiectasis and spontaneous pneumothorax, 1 each (0.05% each). The incidence of tuberculosis (59.28%) is greater than that of any other disease of the respiratory apparatus. Chronic bronchitis, emphysema and pulmonary fibrosis, and bronchial asthma constitute the group known as chronic pneumopathies of nonspecific etiology. Chronic pulmonary diseases other than tuberculosis were present in 77 patients, or 3.85% of the total 2,000 cases and 29.24% of the cases of respiratory disease. Their incidence increases with the age of the persons in each group. Of 77 patients presenting nontuberculous chronic pulmonary diseases, only 21 returned to work, 19 of them within a year; most of them had asthma. Fifty-six retired or died within a year.

Turbidimetric Method for Determination of Small Amounts of DDT.—To control the results of mass house spraying with DDT by the National Malaria Service, a method was sought to measure accurately the small amounts of the insecticide remaining on the walls. The collection of specimens for analysis was done according to the process suggested by Alessandrini, i. e., scraping with a metal brush a surface of 25 sq. cm. Four colorimetric methods were tried (those of Alessandrini, Chaikin, Bayles and Payne, and Castillo and Stiff); all were rejected because of interference caused by the color pigments of the paints and by the emulsifiers used for the spraying. Kenk Kemp and Hilda A. Aguidar, of the Institute of Malariology, tried to adapt to microanalysis the Gunter-Neal turbidimetric method. The authors determined the amount of insecticide recovered from white, pink, gray, and yellow walls on which 1, 2, 3, and 4 mg. of DDT, respectively, had been sprayed; the respective amounts found were 1.00, 1.85, 2.99, and 3.90 mg. The method is easy to perform, without danger from the reagents, free of interference from the colored pigments of paints, and economical, since the alcohol utilized can be recovered by distillation.

CORRESPONDENCE

STREPTOCOCCUS ERYSIPELATIS NEEDED

To the Editor:—The Institute for Cancer Research urgently needs a virulent strain of Streptococcus erysipelatis isolated from an *untreated* case of erysipelas. It is recommended that any doctor willing to help us should obtain the organism by withdrawing the serum by hypodermic syringe from within the lesion and sow the material on an agar slant for shipment by air mail.

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SUICIDE FOLLOWING CORTISONE TREATMENT

To the Editor:—I have just perused the article "Suicide Following Cortisone Treatment" (*J. A. M. A.* 146:337 [May 26] 1951). Certainly it is of value to have this case history of suicide coincident to cortisone therapy recorded in The Journal for all to see and be thus alerted to such possible hazard. However, a patient in a state of acute reactive depression with manifest suicidal inclinations should not be allowed to remain in her own home and under the surveillance and care of her family. It has been recognized for many years that any patient possessed of suicidal intent will succeed therein unless placed in an institution where means to such self-destruction do not exist and where the patient can be given constant and skilled attention.

Such acute suicidal psychoses occur widely and have been occurring long before modern drug therapy was discovered. The imperative need for commitment of such patients has long been known. Yet the recurrence of such preventable suicides in our communities, despite our vaunted progress in medical science, points to the utility and wisdom of again stressing the point that the doctor should insist on the immediate commitment of any patient who exhibits the least inclination to homicide or suicide.

Albert Hulett, M.D.,
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RESISTANCE TO PENICILLIN

To the Editor:—In two editorials in the April 21 issue of The Journal of the American Medical Association, emphasis is directed to the emergence of penicillin-resistant bacterial strains, inferentially warning the medical world that ominous clinical problems may develop. In the *Archives of Surgery*, April, 1945, in a paper on "Topical Use of Concentrated Penicillin in Surface-Active Solution," and in The Journal of March 30, 1946, in another one on "Nonoperative Treatment of Osteomyelitis with Penicillin," a technique of multiple chemotherapy was described, with the use of an antibiotic (penicillin) and a detergent (aerosol OT), in which factors involved in the development of resistant strains were detailed, with attention directed to methods of controlling this problem.

It is urged that all physicians using antibiotics return promptly to the basic principle of microbiology controlling this phenomenon of resistance. That clinically better results may follow the wisdom of such fundamental therapy is obvious, as was noted in the September 1950 issue of *Surgery, Gynecology and Obstetrics* ("Modern Treatment of Chronic Osteomyelitis with Topical Detergent Antibiotic Therapy").

The medical profession, especially in this country, must become immediately mindful of the damage that is being done when resistant bacterial strains emerge, for we are producing and probably disseminating another type of infectious disease in which antibiotics may do infinite harm to the patient and not only impede his recovery but hasten his death.

Edwin J. Grace, M.D.,
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GENERAL PRACTICE

To the Editor:—Does the resurgence of the "general practitioner pose a threat to good surgical care? No! In a letter in, The Journal May 19, 1951, Dr. Edwin P. Lehman, director of the department of surgery at the University of Virginia, takes the opposite view of this question. There are many who would not agree with certain thoughts he has endeavored to develop, and it is only fair that these expressions be given voice.

No one interested in the revival of the "family doctor" has suggested that he be universally accorded surgical privilege. No one participating in the formulation of policy of the American Academy of General Practice has endeavored to support any person, member or nonmember, in his personal application for surgical appointment. However, we have endeavored to make it possible for the family doctor interested in surgery and desiring to improve himself in this field to have the opportunity for such advancement, to the same degree that he might anticipate it in other of the specialties. Certain principles have been put down in black and white whereby it is believed this can be assured without jeopardizing the proficiency of care that the patient may anticipate and, a step further, in setting up safeguards to insure a constant review and supervision of all surgical work done in order that laxity by any member of the staff may be discouraged and prevented.

Is there a scarcity of well-trained surgeons? We agree that surgical diagnosis is of paramount importance. We agree that preoperative and postoperative care is the most important element, other than diagnosis, in surgical care. Some workers do not possess mechanical ability and would never master a mechanical procedure. However, is surgical technique in itself so involved, so complicated, as to justify the awe in which the surgeon would be held? Is not his "one tract" approach to the treatment of disease a greater danger to the patient than a few added minutes on an operating table because of the surgeon's relatively lesser dexterity in tying a knot? Is it not true that at a recent sectional meeting of the American College of Surgeons an official of the college admitted that a medical audit of a hospital's records showed more unnecessary surgery was done by members of the board and the college than by a general practitioner enjoying surgical privilege? Is it not true that in many smaller communities general surgeons endeavored to treat conditions other than those purely surgical, and is it not true that their approach to such other disease would in all probability be much less adequate than would the general practitioner's approach to a surgical problem in which he had been found competent by his colleagues?

Dr. Lehman asked support for the program designed to increase interest in general practice and attract men to this field. Yet he, a general surgeon, would establish the limitation of the man in this field. Would he accept the general practitioner's limitations of his practice within the field of general surgery? Would he, for a minute, suggest to us in general practice that, if we accept his ideas regarding our limitations, we would then be left free and not subject to the limitations that would be imposed by the obstetrician, the pediatrician, the cardiologist, and members of other specialty groups?

General practice differs from the specialty fields primarily in the philosophy of the man engaged in it. The general practitioner is interested in the broad concept of medicine and is not concerned with the minutiae involved in the treatment of the rare or obscure case. That he will develop special interests and capabilities is understandable, but that he should decide what these will be and how they will be expressed is his right. That it is the responsibility of the medical profession, specialists and general practitioners, to evaluate honestly and without prejudice the professional work done in the community (which primarily concerns the hospital) is the real crux of the matter. It is necessary that the profession assume responsibility on the local level for the medical care rendered and find some means for controlling the practice of its members in all fields to guarantee that the work they perform will be done proficiently and that no artificial standards or barriers will be imposed. Standards and procedures suggested by the A. A. G. P. give promise of success in this endeavor if given adequate fair trial.

We want more men in general practice—Dr. Lehman agrees. Hospital association is essential if the practitioner (specialist or family physician) is to keep himself abreast of current medical progress. Therefore, all doctors in the area should enjoy hospital appointment. The degree of activity of the individual physician in treating a patient in the hospital, be it medical, surgical, or obstetric, should be determined by ability as demonstrated, and not by any artificial prerequisite of training or special society membership. The general practitioner will not be content to serve as the "scut boy" and must be allowed additional hospital privilege in any of the specialty fields in which he demonstrates ability. His continued cooperation in the hospital program, the continuation of his education, his increased service to his patient, and his over-all development as a citizen in the community is dependent on his being offered the opportunity of advancement. No specialty group should be allowed to impose its ideas and prerequisites for membership on the group determining a man's staff privilege.

The growth of specialty boards did much to improve medical standards. However, they were built by those who had served conscientious preceptorships in obtaining the proficiency that made possible the training of specialists now in these boards. That one would revert to a program of trial and error in the training of doctors is unthinkable. However, that one should discard the proved value of the preceptorship plan of training is equally unthinkable. That long periods of prerequisite "in residency" training should be required of all doctors is an impossibility and actually not desirable. The American College of Surgeons has done a memorable job in its hospital standardization program. They have provided for special recognition of the man in a specialty field but have also insured opportunity for the man who is found capable through his innate ability and through proper application in the field to practice procedures within it. They have expressed themselves as being opposed to the closed staff principle in regard to surgery, as well as in general.

The implied tragedy lies in the threat to good medical and surgical care through failure of the members of the medical profession properly to supervise the work done in the hospitals and not in making it possible for proficiency and ability to be the determining factors in a man's hospital activity. Arbitrary rules regarding fixed periods of prerequisite training should not be accepted as a guarantee in these regards in any specialty field. A man who has completed a stipulated period of residency training should be and is more readily accorded privilege when he confines himself to the particular field of his training. Let us then encourage all men in medicine, wherever their special interest, to contribute their part to the better care of the patient, better preparation of themselves for the service they render, more unselfish interest in those they serve, and more time to the effort to improve the relationships among those within this great profession. Progress is the keynote. Let us not hastily cast aside proved means to this end; we should adapt them so that they will contribute in these days of rapid advancement in the profession.

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REFERENCES TO CLOTTING IN BIBLICAL LITERATURE

To the Editor:—On page 280 of The Journal for May 19, the writer of the interesting letter on "Biblical Allusions to Clotting" says there are no references to clotting phenomena in the New Testament. He has evidently overlooked John xix. 34: "One of the soldiers with a spear pierced his side, and forthwith came there out blood and water." The Lord had been dead for almost three hours, so that the fluid which the Apostle calls "water" must have been serum. The time given would have been ample for clotting to begin and for some blood to remain unclotted.

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ADIE'S SYNDROME

To the Editor:—Kern's article on Adie's syndrome in The Journal (Jan. 27, 1951) brings to mind the words of Martin Joseph Routh: "You will find it a very good practice always to verify your references, sir!" Kern's first two references are incorrect. The page Kern quotes for Strasburger's article, 1388, does not exist in that volume. The articles of Strasburger appeared in *Neurol. Centralbl.* **21**:738 and 1052, 1902, and those of Saenger in the same journal, **21**:837 and 1137, 1902. Oddly enough, in their article, Kennedy, Wortis, Reichard, and Fair quote Strasburger's article as being on exactly the same page, 1388. Kern writes: "The association of a tonic pupil and the absence of tendon reflexes was first described independently by Saenger and Strasburger in 1902." Strasburger preceded Saenger in describing the tonic pupil, but nowhere did either author mention its association with "the absence of tendon reflexes." After tonic pupil had been described, many writers mentioned its association with "the absence of tendon reflexes" but did this only casually. This association is usually called Adie's syndrome because of his work of 1931 and 1932. Historic justice, however, demands mention of the work done six years before Adie's publication, that of the Frenchmen Weill and Reys (*Rev. d'oto-neuro-ocul.* **4**:433 [June] 1926). To be historically correct, an eponym containing a half dozen names would have to be applied to this syndrome. If an eponym is to be used, it should be Weill-Reys. But all this confusion can be avoided when a physiologic name is used: "pseudotabetic pupilotonia." To the student this would mean more than any eponym.

It is time that something be done to prevent this epidemic of eponyms in neurological textbooks and literature. "Tuberculous spondylitis" tells the student more than "Pott's disease," "generalized neurofibromatosis" more than "von Recklinghausen's disease," and "finger flexor reflex" more than "Hoffmann, Troemner, Rossner, Bechterew, etc., reflex." We need more physiology and fewer eponyms.

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COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

UNIVERSITY OF OTTAWA FACULTY OF MEDICINE APPROVED

At its meeting on June 8, 1951, the Council on Medical Education and Hospitals voted to extend its approval to the University of Ottawa Faculty of Medicine, Ottawa, Canada. The action of the Council was based on a survey carried out by representatives of the Council and the Association of American Medical Colleges, April 2-6, 1951.

This medical school was established in 1945. The course of instruction extends over a period of six years, the first year being devoted to premedical studies and the last to a required internship. The first students were admitted to the first year class in the fall of 1945. The first sixth year class was enrolled in the fall of 1950 and graduated in May 1951.

In accordance with long-standing policy, approval is not granted any medical school until representatives of the Council survey the school after instruction has been instituted in all years of the medical course. The Council's approval, however, applies to all students in good standing at the school at the time it was officially inspected in April, 1951.

At its meeting on June 1, 1951, the Executive Council of the Association of American Medical Colleges voted to recommend to that association at its annual meeting in October, 1951, that the University of Ottawa Faculty of Medicine be admitted to affiliate membership in that association. This is the class of membership held by other Canadian medical colleges.

Donald G. Anderson, M.D., *Secretary.*

MISCELLANY

THE UNITED STATES CHILDREN'S BUREAU

Prepared by Malcolm D. Lamborne Jr., of the A. M. A. Washington Office

The Children's Bureau is a federal agency authorized to advise parents on problems of child care and to help public and private agencies improve welfare and health services to children. The bureau's activities are particularly pertinent today because of legislative proposals that would give it authority to operate an Emergency Maternity and Infant Care (EMIC) program similar to the World War II plan, which paid for medical, nursing and hospital services for 1,454,000 maternity and infant cases of families of servicemen at a total of 125 million dollars.

The bureau's field of operations and budget have been steadily expanded. In 1912, the appropriation was $25,640 (all administrative) and the staff numbered 15. Now, the appropriation is approximately 32 million dollars, of which 95% is made up of grants to states, and the staff totals 260, including 17 physicians.

In the fiscal year ending June 30, the bureau received from Congress a total of $30,250,000 for grants of all types. Also available to states for grants were balances of $3,078,724 from previous years. The bureau's administrative budget for this year amounts to $1,500,000, including money for fact finding and reporting.

Miss Katharine F. Lenroot, bureau chief, estimates over three million pieces of literature, a great number of them bulletins for parents, were distributed in the past year. Some 26 million copies of *Infant Care*, first published in 1914 and revised seven times, have been sold or given away. It has been translated into six foreign languages, and is the Government Printing Office's all-time "best seller."

Miss Lenroot has been the bureau chief for 17 years. She reports to the Commissioner for Social Security who, in turn is responsible to the Federal Security Administrator. Miss Lenroot's office directs all bureau activities, formulates policies for the staff, cooperates with national and state commissions and organizations concerned with children and youth, and advises in planning for the White House Conferences on Children and Youth, which have been held approximately every 10 years since 1909. She is the U. S. member of the executive board of the United Nation's International Children's Emergency Fund.

ORGANIZATION

There are now six divisions operating under Miss Lenroot.

The *Division of Research* (Edward E. Schwartz, acting director) conducts research on physical, social, and emotional growth and development of children; develops standards growing out of research; conducts a clearing house for current research in child life; provides statistical service to the bureau, and prepares, in cooperation with the Division of Reports, bulletins on child care for parents. It has a staff of 46 and a budget for 1951 of $239,022.

The *Division of Reports* (Mary Taylor, director) publishes bulletins for professional and lay groups and a monthly periodical, *The Child;* designs exhibits for professional groups, and furnishes informational service to the press, magazines, radio, and other media. It has a staff of 23 and a budget of $247,826, including printing costs of bureau publications distributed free.

The *Division of Health Services* (Dr. Arthur J. Lesser, acting director) develops policies and recommendations for health services for mothers and children; administers grants to state agencies for maternal and child health services, for which $14,070,518 is available in fiscal 1951; administers grants to states for services for crippled children, for which $10,269,286 is available in the same period; provides advisory services for public and voluntary agencies on technical and administrative aspects of medical care and health services for mothers and children, and provides consultation to state agencies and private groups on pediatrics, obstetrics, orthopedics, cardiology, nursing, dentistry, hospital administration, physical therapy, medical social work, and nutrition. It has a staff of 80 and a budget of $494,058.

The *Division of Social Services* (Miss Mildred M. Arnold, director) develops policies for administration of grants and recommends standards of care of children by agencies furnishing social services to children in their own homes, in foster family homes, in institutions, and in juvenile courts, for which $8,988,920 is available for grants in fiscal 1951. It has a staff of 49 and a budget of $287,573.

The *Division of International Cooperation* (Miss Mary Larabee, acting director) cooperates with other countries in setting up and improving services for children under the Point IV (technical assistance) Program; provides consultation services to medical, nursing, nutrition, and social service agencies in other nations; develops training programs for professional people from other countries, and promotes international exchange of technical information on matters relating to child life. It has a staff of 9 and a budget of $71,700 from funds transferred by the State Department.

The *Division of Administrative Services* (Mrs. Laura E. Warren, director) plans and directs administrative activities essential to operation of the bureau; aids in drawing up budget and presenting it to Congress; maintains budgetary control over all bureau appropriations, and operates personnel and correspondence services. It has a staff of 42 and a budget of $146,298.

HISTORY

The Children's Bureau came into being April 9, 1912, with President Taft's signature on a bill sponsored by the late Senator William E. Borah and passed by the 62d Congress. The bill directed that the bureau shall "investigate and report upon all matters pertaining to the welfare of children and child life among all classes of our people, and shall especially investigate the questions of infant mortality, the birth rate, orphanages, juvenile courts, desertion, dangerous occupations, accidents and diseases of children, employment, legislation affecting children in the several states and territories."

Its formation is cited by child welfare leaders as an outgrowth of the first White House Conference on Children called in 1909 by President Theodore Roosevelt. The Bureau began in the Department of Commerce and Labor. In 1913, when separate departments were created, the bureau was made a part of the Labor Department and it remained there until its transfer, in 1946, to the Federal Security Agency. The year 1921 marked the beginning of a new emphasis and direction for the bureau. In that year, Congress passed the Federal Maternity and Infancy Act, popularly known as the Sheppard-Towner Act, which provided for grants to states (amounting then to $1,240,000) to assist in reducing maternal and infant mortality and for protecting the health of mothers and infants. Control of the program was vested in a Federal Board of Maternal and Infant Hygiene. The board was made up of the Children's Bureau chief, the Surgeon General of the Public Health Service, and the Commissioner of Education. It had authority to approve or reject state plans and to withhold federal funds from any state whose program was not operating as agreed on by the board and the state. During the life of the act, 45 states received grants. The Sheppard-Towner Act expired in 1929. The bureau for the next six years devoted itself exclusively to child research, fact finding and dissemination of information on child problems. With the passage in 1935 of the Social Security Act, the bureau returned to the field of state grants.

GRANTS

The Social Security Act provides for three Children's Bureau grant programs, which have continued in operation to the present time:

Maternal and Child Health Services.—Federal funds are distributed to state health departments, which use the money for the following purposes: salaries and training of professional

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Another in a series of special studies toward better understanding of the operations of federal agencies.

personnel to conduct prenatal and postnatal clinics, well-child conferences, home and school visits by public health nurses, immunization services, medical and dental services for school-age children and other services. Including balances from previous years, there is available this fiscal year government funds of $14,070,518 for maternal and child health services. States must match half of the federal grants. The amount of federal money made available to each state is determined by a formula based on (1) the number of live births in the state in relation to total live births in the United States, (2) the state's financial need for help in providing services as indicated by per capita income, and (3) the number of live births in rural areas. Under this program, the bureau estimates that some 700,000 infants and preschool children attend well-child clinics annually, doctors make more than 2,300,000 examinations of school children, more than 170,000 expectant mothers attend medical conferences during pregnancy, and more than 1,500,000 children are immunized against smallpox and diphtheria.

Crippled Children Services.—Through state crippled children's agencies, federal funds help pay the cost of diagnosis and of medical, hospital, and convalescent care for children with crippling conditions. This year's funds for grants, including balances from previous years, amount to $10,269,286. In this program, too, states are required to match half of the grants. The amount of federal money a state may obtain is determined by a formula based on (1) the number of persons in the state under 21 years, (2) the state's financial need in carrying out its program as indicated by its per capita income, and (3) the number of persons under 21 in rural areas. Over 200,000 crippled children annually receive some kind of professional service, according to the bureau.

Child Welfare Services.—Through state welfare departments, federal funds help to support a wide range of social welfare services by paying a part or all of the salaries of trained child welfare workers for children who are neglected, orphaned, or delinquent. Some funds are used to pay for the actual care of children in foster homes. Federal funds including previous balances amount this year to $8,988,920. A state's share of grants is determined by the proportion of its rural youth under 18 years to the total rural child population. No fixed amount of matching funds is required for child welfare services grants, although each state must assume some of the cost. The bureau reports that more than 230,000 children annually receive services.

FEDERAL SUPERVISION

To qualify for funds in any of the three programs, state agencies must present plans which in the judgment of the bureau meet the requirements of the Social Security Act and assure a "good quality of service." State agencies are required to report their expenditures to the bureau at the end of each year.

All state plans are subject to approval or rejection by the bureau chief under power delegated by the Federal Security Administrator. This is in contrast to the Sheppard-Towner Act's tripartite board, which had final authority. Before funds are withheld, a state agency must be notified and opportunity for hearing given by the Federal Security Administrator. There is no provision for court appeal.

THE FUTURE

Dr. Edwin F. Daily, retiring chief of the Division of Health Services, who recently reviewed infant and maternity care progress of the last 15 years, reported a decrease of more than 80% in maternal mortality, a decline of almost 45% in infant mortality after the first few weeks, and an increase of almost 100% in the proportion of hospital deliveries. Just how much these gains may be attributed to the bureau's efforts and how much to progress in medical sciences cannot be accurately assessed. Miss Lenroot believes that federal officials should look toward new areas of activity. She emphasizes that, if civil defense or mobilization brings major family dislocations, then "new or expanded services for children will make a large claim on our public and private pocketbooks." One of these services might be another EMIC program.

BUREAU OF LEGAL MEDICINE AND LEGISLATION

MEDICOLEGAL ABSTRACTS

Malpractice: Failure of Physician to Perform Caesarean Section When Requested by Patient.—The plaintiff sued for damages resulting from the alleged negligence of the defendant in postponing, contrary to her request, the performance of a Caesarean section. From a judgment in favor of the plaintiff, the defendant physician appealed to the court of civil appeals of Texas.

The plaintiff arranged for the defendant physician to attend her at the birth of her child which was expected to occur about two months later. She was then thirty-two years of age and had previously given birth to two children in another state, one in November, 1941, which lived only seven and a half hours and the other in November, 1942, which is a normal, healthy child. Plaintiff gave the defendant a complete history of her prior experiences and related many statements made to her by the doctors and nurses who attended her during the previous deliveries. She entered the Santa Rosa Hospital in San Antonio on the evening of November 12, 1947. Her labor, as in her prior experiences, was not steady or strong, and she was given "pitocin" which was intended to increase labor. She would have pains for a limited time and then quit, and she was taken to the delivery room in the hospital several times, but labor was not sufficiently strong or advanced to bring about the birth of the child. On the morning of the sixteenth, she was taken to the delivery room and placed under an anesthetic, was returned to her room until about 8:00 p. m. on the same date and was then again taken to the delivery room. The plaintiff introduced in evidence a statement which was signed by the defendant and entered in the hospital records showing what happened during the evening of November 16. That statement was as follows: "Patient was given a general anesthesia. Examination was made which showed that this baby's head was high. Forceps were considered, but it was decided that it would not be practical to apply forceps to the head as high as it was. Due to the fact that the patient had been in labor four days and the patient had adequate room it was thought best to do a version extraction. A deep ether anesthesia was given and hand placed up into the uterus. A very strong Bandl's ring was encountered, which would not relax even in extreme anesthesia. Nevertheless, an attempt was made to reverse the baby. Despite repeated attempts and despite the fact that the foot was drawn down to the head, the baby could not be diversed from a vertex position. In doing this the cord was found to be wrapped around the baby's neck. This became loosened and the cord prolapsed. This was divided between the head and the bony parts of the pelvis, which cut the baby's blood supply off. It was then decided to do a Caesarean section. Plaintiff was brought to the operating room still under anesthesia and transfusion was started."

It is definitely settled in Texas, said the court, that a patient has no cause of action against his doctor for malpractice, either in diagnosis or recognized treatment, unless he proves by a doctor of the same school of practice as the defendant (1) that the diagnosis or treatment complained of was such as to constitute negligence and (2) that it was the proximate cause of the patient's injuries. In order to prove that the defendant was guilty of actionable negligence in failing to deliver the child by Caesarean section on the morning of November 16 and in delaying such operation until the evening of the same date, it was necessary for plaintiff to show by competent admissible evidence that such failure and delay constituted a breach of the legal duty which the defendant owed to his patient of exercising ordinary skill and care in his professional efforts properly to deliver the child. Expert medical evidence was essential to such proof because the matter of determining whether to use forceps in the delivery of the child or to do a version extraction, or to do a

Caesarean section and when or under what circumstances, if at all, a reasonably skilful physician and surgeon would or should have resorted to any or all of these various alternatives, involved a practice of a highly specialized art and a learned profession with respect to which no layman could have any personal knowledge or experience on which the court might rely for guidance. Therefore, proper, expert medical evidence was a necessary element in, and an essential part of, the proof required of the plaintiff in order to show negligence and proximate cause.

The defendant, called as a witness by the plaintiff, was the only medical expert witness who testified in the case. He was interrogated fully and in detail under direct and cross-examination as to what he did in the diagnosis and treatment of the plaintiff and as to why he followed the course of procedure which he described. He did not testify to any fact or facts which in our opinion, said the court, showed or tended to show that he was guilty of negligence in failing to perform a Caesarean section sooner than he did. On the contrary, we think his testimony as a whole completely exonerated him of these charges. He testified that no doctor had the right to perform a Caesarean operation unless the facts in the case indicated that such operation was necessary and that he and his professional associates and consultants thought the plaintiff could have the baby normally until the evening of the sixteenth, when the operation was performed. The following questions and answers are typical of his testimony as a whole: "Q. During the course of your treatment of this woman did she ask you to take the child by Caesarean? A. Many times. Q. Why didn't you do it? A. Because I thought my judgment was better than hers." If in fact the defendant was using his best judgment in the diagnosis and treatment of his patient and if in good faith he was exercising that degree of skill and ability which constitutes good practice according to the standard of the medical profession in San Antonio and vicinity, said the court, then as a matter of law he was not guilty of malpractice or negligence and was not legally liable to plaintiff for damages flowing from bad results, if any, of his diagnosis or treatment.

The plaintiff testified that she wanted the child delivered by Caesarean operation and that she requested the defendant repeatedly, from November 14, to perform such operation. This testimony, said the court, must have been the basis upon which the jury made its findings of negligence. However, even though the plaintiff and her relatives wanted the operation to be performed sooner than it was, we do not think, the court concluded, that such desire on their part, irrespective of the reasons or motives which might have prompted the same, was sufficient to form the basis for a legal inference of negligence on the part of the defendant in failing to perform the operation sooner than he did. After due consideration of all the competent admissible evidence in the case, the court, therefore, concluded that such evidence was wholly insufficient to sustain the findings of the jury with respect to actionable negligence on the part of the defendant in failing to deliver the child by Caesarean birth on the morning of November 16 or in delaying the Caesarean operation until the evening of that day.

Accordingly the judgment in favor of the plaintiff was reversed and the cause was remanded to the trial court with instructions to enter judgment for the defendant physician.—*Christian v. Galutia*, 236 S.W. (2d) 177 (Texas, 1951).

Malpractice: Application of Doctrine of Res Ipsa Loquitur.—The plaintiff filed suit for damages for x-ray burns alleged to have been caused by the negligence of the defendant physician in administering treatments for papillomae. From a judgment in favor of defendant physician, the plaintiff appealed to the district court of appeal, second district, division two, California.

Prior to consulting the defendant for relief, the plaintiff was suffering from papillomae on the ball of each foot. The affliction had caused her considerable pain and had not responded to other treatments. The defendant administered x-ray therapy to her on three occasions at weekly intervals commencing Feb. 6, 1947. The relationship of physician and patient terminated about six weeks after the last treatment. At that time, according to the plaintiff, those portions of the soles to which x-rays had been applied were deep red at the center, pink in the circumference of the circle and it was all tender. In July, the area treated started to granulate. To use the words of the plaintiff, it "had the appearance of crystalized fruit," and from that time sloughing of the tissue continued and thereafter small blisters developed over the injured areas and over the dorsum of each foot. In February, 1948, the plaintiff was attended by a chiropodist who testified that the ball of each foot over a circle one inch and a quarter in diameter was denuded and that there was a colorless exudate from the area such as is seen in burns. The condition did not respond to treatment by the chiropodist and the plaintiff was unable to pursue her ordinary occupation from May until October, 1948. Thereafter she received treatment from a dermatologist and the lesions on the bottom of her foot healed leaving scar tissue over the sites of the lesions which the plaintiff testified were sore and which apparently did not have the same amount of tissue underneath the surface as the balance of the area of her sole. The defendant and the plaintiff both testified that the x-rays were administered by placing a metal tube with an opening at the outer end three-fourths inch in diameter against the bottom of the foot at the site of the papilloma. The balance of the foot, according to the defendant, was shielded by a sheath of lead, although the plaintiff had no recollection of the use of the lead shield.

The plaintiff first contended that the evidence was sufficient to warrant submitting the issue to the jury under the doctrine of res ipsa loquitur. The application of res ipsa loquitur, said the court, is necessarily limited in the field of malpractice. The courts have applied it in only a restricted class of cases where the layman is able to say as a matter of common knowledge and observation that the consequences of professional treatment were not such as ordinarily would have followed if due care had been exercised. It cannot be said, as a matter of common knowledge, that the condition which the plaintiff described which included blisters and sores on the soles and tops of her feet and on her shins was caused by the negligence of the defendant. In the absence of expert medical testimony the inference that the condition was proximately caused either by a change in the original condition suffered by the plaintiff or by some new trouble having nothing to do with the radiation was just as reasonable. Under such circumstances, said the court, the res ipsa loquitur doctrine is not applicable.

The plaintiff also urged a reversal on the grounds that the court erred in refusing to permit a chiropodist to testify that in his opinion the injury was an x-ray burn. The record showed that the chiropodist was a graduate of a school of chiropody, that he was licensed in California to treat diseases of the feet and thereby permitted to use x-ray treatments: that he had had courses in anatomy, physiology, histology, bacteriology, physiotherapy and x-ray; that he had spent four and a half years in the Navy attached to an x-ray department of a hospital; that he had studied dermatology and skin conditions. However, it was also shown that the witness had not studied the use of x-rays for treatment; had never in his practice administered x-ray treatments therapeutically; only once had he ever had occasion to distinguish between skin conditions arising from x-ray burns and those resulting from the direct application of heat which was in 1935; he had never treated such a burn; had seen only two cases of x-ray burns in forty years of practice; his use of x-ray in the Navy was for diagnostic purposes only, the therapeutic work having been performed by another department. There was no evidence introduced of any private study on the subject through attendance at lectures, reading or by contact with other men in the field. It is the rule, said the court, that the question whether a person is qualified as an expert is a matter ordinarily addressed to the sound discretion of the trial court, and its ruling on appeal will not be disturbed unless a clear abuse of such discretion is demonstrated. In this case the trial court decision cannot be said to reflect an abuse of discretion.

Accordingly the judgment in favor of the defendant physician was affirmed.—*Bennett v. Los Angeles Tumor Institute, et al.*, 227 P. (2d) 473 (California, 1951).

MEDICAL LITERATURE ABSTRACTS

AMERICAN

A.M.A. Arch. Indust. Hyg. & Occup. Med., Chicago

3:339-444 (April) 1951

Report on Country-Wide Study of Silicosis in Metal Mines of Japan. M. Yamamoto.—p. 339.
Present Condition of Workmen's Compensation Laws, and Possible Changes. M. Dawson.—p. 350.
Retention of Air-Borne Particulates in Human Lung: II. H. D. Landahl, T. N. Tracewell and W. H. Lassen.—p. 359.
Effects of Employment on Course of Heart Disease. L. J. Goldwater and others.—p. 367.
Value and Operation of Industrial Medical Program. M. N. Howard and A. E. Hoag.—p. 375.
Evaluating Trichloroethylene Exposures by Urinalyses for Trichloroacetic Acid. A. Ahlmark and S. Forssman.—p. 386.
Health and Air Pollution: Study on Limited Budget. H. Heimann, W. F. Reindollar, H. P. Brinton and R. Sitgreaves.—p. 399.

American J. Digestive Diseases, Fort Wayne, Ind.

18:77-108 (March) 1951

Emergency Surgery in Massive Hemorrhage from High Lesser Curvature Ulcers. F. J. Rack.—p. 77.
Roentgen Features of Non-Malignant Periappendiceal and Ileocecal Lesions. C. Gottlieb, S. L. Beranbaum and M. Dorfman.—p. 79.
Studies on Ascitic Fluid in Patients with Hepatic Cirrhosis, Heart Failure and Cancer: Results of Cephalin Cholesterol Flocculation, Thymol Turbidity, Methylene Blue, Qualitative and Quantitative Bilirubin and Other Tests. G. M. Lepehne.—p. 86.
Evaluation of Findings in Giardia Infestation. C. M. McMurray and D. Cayer.—p. 90.
Metabolic Studies in Gavage and Parenteral Feeding During Prolonged Narcosis Therapy. P. M. Rike, E. A. Loomis Jr. and J. S. Clapp. —p. 92.
Determinants of Food Intake. F. Hoelzel.—p. 96.

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Infection of Gall Bladder and Diabetes. H. J. John.—p. 109.
Prognostic Significance of Nocturnal Gastric Secretion in Ulcer Patients. H. S. Zuckerman, L. W. Leiter and A. J. Kauvar.—p. 122.
*Study of Laboratory Methods for Diagnosing Endamoeba Histolytica and Their Application to 5,048 Persons from Chicago Area. V. M. Young, O. Felsenfeld, W. H. Shlaes and others.—p. 126.
Surgical Treatment of Regional Enteritis. A. J. Ryan.—p. 130.
Non-Psychogenic Functional Disorders of Gastrointestinal Tract. F. W. Wilson.—p. 137.

Laboratory Diagnosis of *Endameba Histolytica*.—Extensive studies were made on methods used for the detection of Endameba histolytica and of their application to the examination of more than 13,000 fecal specimens from 5,048 persons during the past seven years in Chicago and Cook County, Illinois. Combined focal and proctosigmoidoscopic specimens examined within 30 min. after collection, with the use of hematoxylin-stained slides and zinc sulfate flotation, gave optimal results. Variations in the survival time of various strains of E. histolytica in stool specimens at different temperatures were demonstrated. This irregular behavior of E. histolytica necessitates preservation of the specimen if examination is not done within 30 min. Advantages of polyvinyl alcohol and Schaudinn's fixative for hematoxylin-stained slides and the advantages of a 37% aqueous solution of formaldehyde (formalin®) and D'Antoni's stain for flotation were pointed out. Results of stool examination for components other than parasites and bacteria were compiled, and it was shown that they lack value for etiological study but are useful in guidance of symptomatic treatment. Results of surveys for E. histolytica in different groups of persons showed that 4.2% of 237 symptomless medical students and 11.6% of 796 symptomless food handlers harbored E. histolytica. Findings did not reveal so great a difference in percentage of cases of chronic diarrhea between poor patients and those of higher economic status as might be expected. A high proportion (30.6%) of physicians suffering from chronic diarrhea after overseas service had an amebic infection. The approximate proportion of E. histolytica infestations in patients suffering from chronic intestinal disturbances in the Chicago area is estimated as 20% ± 3%.

American J. Obstetrics and Gynecology, St. Louis

61:477-712 (March) 1951. **Partial Index**

*Iron Metabolism in Human Pregnancy as Studied With Radioactive Isotope, Fe^{59}. P. F. Hahn, E. L. Carothers, W. J. Darby and others. —p. 477.
Preliminary Evaluation of Cave's Roentgenographic Method of Fetal Cephalometry. T. W. McElin, S. B. Lovelady, R. W. Brandes and others.—p. 487.
*Treatment of Pelvic Inflammatory Disease in Women with Chloramphenicol. C. S. Stevenson, N. J. Kohlerman, E. F. Snider and S. S. Schlingman.—p. 498.
Chorionic Gonadotropin in Blood and Urine During Early Pregnancy. R. A. Smith, A. Albert and L. M. Randall.—p. 514.
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Priscoline in Therapy of Dysmenorrhea. R. B. Greenblatt, W. E. Barfield and D. O. Hammond.—p. 565.
Of What Value is Male Hormone in Management of Genital Cancer in Female? N. F. Miller, G. Thompson and W. Johnson.—p. 582.
Diagnosis and Evaluation of Thrombocytopenic Purpura in Gynecological Bleeding: Report of 15 Cases. W. J. Reich, M. J. Nechtow, A. M. Kurzon and T. Mercer.—p. 589.
Endometrial Carcinoma. J. H. Randall, D. F. Mirick and E. E. Wieben. —p. 596.
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Prolonged Labor: Study of 211 Cases. J. R. Winterringer.—p. 622.
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Use of Large Doses of Progesterone in Delaying Onset of Labor After Premature Spontaneous Rupture of Membranes. E. Eichner and K. Kunin.—p. 653.
Postpartum Engorgement of Breast. M. Newton and N. R. Newton. —p. 664.
Treatment of Menopause. II. W. H. Perloff.—p. 670.
Cutaneous Pregnancy Test. N. Ferrero.—p. 672.
*Intravenous Alcohol as Obstetrical Analgesia. E. R. Chapman and P. T. Williams Jr.—p. 676.

Iron Metabolism in Human Pregnancy.—Iron tagged with the radioactive isotope Fe^{59} was fed in single doses ranging from 1.8 to 120 mg. to 466 healthy women at various stages of pregnancy, and the uptake of iron determined. As the dosage was increased from 9 to 18 mg. and over, the percentage of the total dose of iron found in the maternal red blood cells decreased, while the amount of iron taken up increased progressively with the dose. As gestation progressed, the uptake of iron increased to the extent that at 30 weeks' gestation and later, three or more times as much iron was absorbed as during the period before the 15th week of gestation, but a three-fold increase in dose from 39 to 120 mg. of iron after the 25th week of gestation produced only a slight increase in terms of milligrams of iron absorbed and utilized. These observations suggest that "preventive" or "protective" iron therapy, even when intensive, may be a relatively inefficient procedure in early gestation. In the latter part of gestation, such protective therapy may be more efficient, but it would seem that single doses of 120 mg. of iron offer little advantage in terms of actual iron incorporated into the maternal red blood cells over considerably smaller doses. The variation in uptake of the fetus with varying dosage did not appear to be greatly different from that of the mother. Relatively little variation in the amount of radioactive iron in the red blood cells of the infant at birth was observed for iron administered at different periods of gestation. The total red blood cell mass of the newborn infant contained on the average about 10% as much radioactive iron as was found in the mother's blood. The ratio of fetal to maternal radioactive iron per milliliter of red blood cells was about one. The uptake of radioactive iron was determined according to parity and period of gestation in

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Titles marked with an asterisk (*) are abstracted.

93 pregnant women. Before the 20th week of gestation, the median percentage uptake was significantly higher in the higher parity groups. In the second half of pregnancy, parity did not influence the uptake. These differences in iron uptake with parity reflect lower iron stores in multiparous women. The normally increased uptake late in pregnancy masked this finding during the latter half of gestation.

Chloramphenicol for Pelvic Inflammatory Disease.—Thirty-two patients, 15 with pelvic inflammatory disease of the nonpuerperal type with pelvic abscess, five with subacute salpingitis without pelvic abscess, nine with infected abortion, two with postpartum sepsis, and one with ruptured appendix were treated with chloramphenicol (chloromycetin®). The causative bacteria were found to be chiefly Escherichia coli, nonhemolytic streptococci, and Aerobacter aerogenes. All but three of the patients had mixed infection. One patient's infection was caused by Staphylococcus albus, and a second patient had beta hemolytic streptococcic septicemia following criminal abortion. Chloramphenicol was administered in divided doses of 0.5 gm. enterally every three hours (total daily dose 2 gm.) for 10 days. Twenty-one of the 32 patients had previously received penicillin, sulfadiazine, and/or streptomycin. There was no response to these agents in 16 cases, a poor and inadequate response in three, and a good response in two, whereas only three of the 32 patients failed to respond adequately to chloramphenicol. The clinical response to chloramphenicol consisted of pronounced symptomatic improvement, usually within 48 hours; rapid disappearance of the peritonitis, and subsequent anatomic regression of the tubo-ovarial inflammatory masses, the patients being ready for exploratory laparotomy within about three to four weeks in the average case. Women who had large pelvic abscesses were treated so effectively with chloramphenicol that posterior colpotomy, with drainage of the abscess, was not necessary for a rapid cure in any of the authors' patients who were treated with this antibiotic from the start.

Intravenously Administered Alcohol as an Obstetric Analgesic.—Intravenously administered alcohol was used alone or combined with meperidine hydrochloride (demerol®) as an obstetric analgesic in 100 women. Alcohol was administered by three general methods. Sixty patients received 7½% alcohol in 5% dextrose in distilled water; the same solution plus meperidine hydrochloride was administered to 27 patients, and 25% alcohol was given to 13 patients. The 7½% alcohol solution combined with small amounts of meperidine hydrochloride is the method of choice. The analgesic effect was excellent and could be altered to suit the obstetrician. There was complete amnesia with the heavier doses and a proportionate degree with smaller doses. Aside from transitory nausea and vomiting, the side effects were negligible. There was no headache, anorexia, or dizziness. There was no maternal death. One infant was stillborn, but there was no reason to believe that the alcohol was at fault. Postpartum bleeding was not increased. The disadvantages of this method are largely those of inconvenience to the attendant. The depth of narcosis must be observed and controlled. Alcohol is of particular value in premature labor and patients with cardiac disease. It appears from trial and theory that the drug should be valuable in eclampsia. Intravenously administered alcohol, as a safe and effective analgesic agent for both mother and child, deserves a place in the armamentarium of drugs applicable to obstetrics.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

35:101-200 (March) 1951

Evaluation of Public Health Measures for Control of Syphilis: Epidemiologic Study. J. E. Moore.—p. 101.

Are Venereal Diseases Disappearing? Over-All Picture Throughout the Country. W. H. Aufranc.—p. 135.

Syphilis and Gonorrhea, New York City: Statistical Review of Registration, Particularly During Five-Year Period, 1945-1949. G. J. Drolet. —p. 138.

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Studies on Life Cycle of Spirochetes: V. Life Cycle of Nichols Nonpathogenic Treponema Pallidum in Culture. E. D. DeLamater, M. Haanes and R. H. Wiggall.—p. 164.

Id.: VI. Life Cycle of Nichols Nonpathogenic Treponema Pallidum in Embryonated Hen's Egg. E. D. DeLamater, M. Haanes and R. H. Wiggall.—p. 180.

Anesthesiology, New York

12:135-260 (March) 1951

Newer Anaesthetic Agents in Children, with Special Reference to Trichlorethylene and Kemithal. C. R. Stephen and H. M. Slater.—p. 135.

Intravenous Supplementation During Nitrous Oxide Anesthesia: Application of Multiple Covariant Analysis to Comparison of Demerol, Morphine and New Potent Analgesic Drug (15431). D. S. Wilkins, S. C. Cullen and M. Brotman.—p. 145.

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Annals of Internal Medicine, Lancaster, Pa.

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Correlation Between Q Waves of aVF and Esophageal Leads in Diagnosis of Posterior Myocardial Infarction. I. L. Rubin and O. A. Rose. —p. 632.

Effect of Single Inspiration in Lead III and Precordial Lead of Human Electrocardiogram. G. L. Norris and E. Massie.—p. 641.

Clinical Notes on Epidemic of Poliomyelitis. N. M. Shutkin.—p. 655.

Hypopituitarism: Studies in Pituitary Tumors and Simmonds' Disease. K. E. Paschkis and A. Cantarow.—p. 669.

Diabetes and Pregnancy: With Special Reference to Prediabetic State. J. M. Moss and H. B. Mulholland.—p. 678.

*Treatment of Two Patients with Hepatorenal Syndrome and Acute Renal Failure by Exsanguinotransfusion. I. Snapper and L. E. Schaefer. —p. 692.

Virus Encephalitis During Poliomyelitis Epidemic: Report of Five Cases. I. Dravin, J. H. Coffey and W. C. Dine.—p. 705.

"Improvement" in Hypertensive Pattern of Electrocardiogram. R. S. Palmer.—p. 712.

*Therapy of Subacute Enterococcus (Streptococcus Fecalis) Endocarditis. L. Loewe, S. Candel and H. B. Eiber.—p. 717.

Variations in Urinary Dilution and Concentration Among Healthy Males Under Simple Standard Conditions. W. E. Storey.—p. 737.

Electrocardiographic Findings in Cardiac Aneurysm. R. A. Steven.—p. 747.

*Fatal Aplastic Anemia Due to Streptomycin: Case Report and Brief Review of Pertinent Literature. C. R. Womack and C. B. Reiner. —p. 759.

Exsanguinotransfusion in Hepatorenal Syndrome.—Exsanguinotransfusion was used in the treatment of two severely uremic patients with hepatorenal syndrome following hepatitis. In both patients prior to transfusion the daily urinary secretion was reduced to between 100 and 200 cc. for several days, and the blood urea nitrogen and creatinine were elevated to about 110 and 10 mg. per 100 cc. respectively. In one patient a preliminary dialysis with the artificial kidney was performed. When on the next day the urinary secretion had decreased to 7 cc. and the general condition had deteriorated, 7.5 L. of citrated blood was given and 7 L. was withdrawn. Diuresis started within 24 hr., and the patient recovered. In the second patient two exsanguinotransfusions were performed four days apart. Diuresis began after the first. While these may have been coincidences, it is likely that the introduction of normal blood protein and alkali (sodium citrate) had a beneficial effect in these cases. It is also possible that some toxic substance was removed.

Therapy of Streptococcus Fecalis Endocarditis.—During the treatment of seven patients with endocarditis due to Streptococcus fecalis, Loewe and associates found that this organism was much more resistant to therapy than Str. viridans. Accordingly they evolved a more intensive and prolonged therapeutic program that produced recovery in three patients with Str. fecalis endocarditis. This consisted of the daily intravenous administration of 10 million units of penicillin in Ringer's solution or, in cases of congestive heart failure, in 5% dextrose in distilled water. The volume of the venoclysis did not exceed 1,000 cc. per 24 hr. Heparin was added in a dose of 50 mg. daily to neutralize the local thrombosing influence of the large doses of penicillin, to prevent deposition of thrombotic masses on the valves, and to promote repair of the endocardial lesions. If ineffective blood levels were obtained with this schedule, more penicillin was given along with enhancing agents such as carinamide (staticin®). Treatment lasted not less than five weeks in previously untreated patients and eight weeks in deteriorated or previously treated patients. If the clinical response was unsatisfactory, streptomycin was added for a short period. Supportive measures, such as transfusions, hematinics, and multivitamin preparations were used as indicated. In the presence of congestive heart failure digitalis and mercurial diuretics were given and sodium and oral fluids were restricted. Penicillin was temporarily administered intramuscularly if necessary. The aim of the program was to terminate the infection during the first span of treatment.

Aplastic Anemia Due to Streptomycin.—The authors report on a man, 76, with laryngeal and pulmonary tuberculosis in whom fatal aplastic anemia developed during streptomycin therapy. Death resulted from gastrointestinal bleeding secondary to thrombopenia. This is the third reported case of this complication of streptomycin therapy.

Annals of Surgery, Philadelphia

133:433-576 (April) 1951

Biologic Principles in Healing of Fractures and Their Bearing on Treatment. D. B. Phemister.—p. 433.
*Progressive Constrictive Occlusion of Abdominal Aorta with Wiring and Electrothermic Coagulation: One-Stage Operation for Arteriosclerotic Aneurysms of Abdominal Aorta. A. H. Blakemore.—p. 447.
Problem of Esophageal Replacement by Jejunum with Particular Reference to Influence upon Circulation of Staging Division of Mesenteric Vessels: Experimental Study and Case Report. H. B. Schumacker Jr. and J. S. Battersby.—p. 463.
Mechanical Strength of Esophageal Anastomoses. R. W. Postlethwait, M. Weinberg, L. B. Jenkins and W. S. Brockington.—p. 472.
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Platybasia: Report of 10 Cases with Comments on Familial Tendency, Special Diagnostic Sign, and End Results of Operation. W. B. Scoville and I. J. Sherman.—p. 496.
Hepatic, Cystic and Retroduodenal Arteries and Their Relations to Biliary Ducts: with Samples of Entire Celiacal Blood Supply. N. A. Michels.—p. 503.
Anatomic and Surgical Significance of Lumbar Sympathetic Nervous System. R. I. Lowenberg and D. E. Morton.—p. 525.
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Percutaneous Arterial Catheterization in Dogs with Special Reference to Aortography. E. C. Pierce II.—p. 544.
*Meconium Peritonitis. G. B. Packard and L. E. Reynolds.—p. 548.
Total Excision of Scalp and Portions of Face; Restoration by Skin Grafting: Surgical Management of Massive Cylindroma of Scalp and Face. B. Goldman.—p. 555.
Hemangio-Endothelioma with Diffuse Involvement of Spleen and Bone: Case Report. W. H. Kastl.—p. 561.
Incision and Method of Wound Closure for Radical Mastectomy. T. G. Orr Jr.—p. 565.
Utilization of Scar Tissue in Bridging Tendon Defects. W. P. Whalen.—p. 567.
Paralysis of Deglutition, Post-Poliomyelitis Complication Treated by Section of Cricopharyngeus Muscle. S. Kaplan.—p. 572.

Treatment of Arteriosclerotic Aneurysms of Aorta.—Blakemore describes a new one-stage treatment of arteriosclerotic aneurysm of the abdominal aorta that combines partial constriction of the aorta, intra-arterial wiring, and electrothermic coagulation. Partial constriction is accomplished by the placement around the aorta just proximal to the aneurysm of a slingshot rubber band sheathed in a polyethylene (polythene®) film containing dicetyl phosphate. The elasticity of the rubber band minimizes erosion of the vessel wall, and the irritative action of the polyethylene film produces a fibrous tissue reaction that further protects against subsequent rupture at the site of the band. The aneurysm proper is filled with coils of fine silver wire that impede the flow of blood and provide a framework on which a clot can form. Controlled heating of the wire by means of an electric current produces clotting of the blood near the walls of the vessel where the current is slowest but none in the center where the current is more rapid. This prevents sudden obliteration of the lumen of the aorta with consequent loss of blood supply to the lower extremities. The use of this technique, sometimes with modification, resulted in improvement of the symptoms and roentgenographic findings in eight cases of fusiform aneurysm of the aorta during an observation period of from several months to over a year.

Meconium Peritonitis.—Meconium peritonitis is a sterile chemical or foreign body peritonitis resulting from intestinal perforation and escape of meconium into the general peritoneal cavity. When this occurs during intrauterine life it is usually due to intestinal obstruction caused by stenosis, atresia, volvulus, or constricting bands. Under these circumstances it is not necessarily fatal. Meconium peritonitis occurring at or immediately after birth may be the result of intestinal obstruction or trauma or both. The characteristic signs are early vomiting and progressive distention. Diagnosis is facilitated by roentgen demonstration of dilated intestinal loops and free air in the abdominal cavity. Prognosis is poor, but early recognition and operation before the sterile meconium has become contaminated with bacteria have saved some of these patients. The author reports two cases. In one peritonitis resulted from intestinal obstruction before birth. Operation shortly after birth proved futile because dense prenatal adhesions prevented reconstruction of the intestinal tract. In the other infant perforation was the result of birth trauma, and recovery resulted after early surgical treatment.

Cancer, New York

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*Hormonal Therapy in Cancer of Breast: I. Effect of Testosterone Propionate Therapy on Clinical Course and Hormonal Excretion. A. Segaloff, D. Gordon, B. N. Horwitt and others.—p. 319.
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Attempts to Determine Harmful Effects of Pulsed Ultrasonic Vibrations. L. A. French, J. J. Wild and D. Neal.—p. 342.
Relative Frequency of Cancer. B. McSwain and R. B. Williams Jr.—p. 416.

Cytology in Diagnosis of Gastric Cancer.—Cytological observations were reported in 875 patients who at one time in their clinical course were suspected of having gastric cancer. Fifty-five (32.8%) of the 168 patients who had cancer showed definite recognizable cancer cells in the smears made from aspirated specimens from the stomach; 31 (18.4%) were suspicious, and 82 (48.8%) were negative. In 25 cases of gastric carcinoma in which lavage specimens were collected and processed promptly, there were correct positive reports in 15 (60%), suspicious reports in two (8%), and definitely false negative reports in eight (32%). It is felt that 60% is about the limit of diagnostic accuracy of any of the lavage methods tried by the authors. Although cytology may be of some help to clinicians it falls far short of being the answer to the existing diagnostic problem. Methods of getting more cell groups from the gastric walls, of concentrating them, and of preparing the material for cytological readings are aspects of the cytological diagnosis of gastric cancer that need further experimental development in the laboratory.

Hormonal Therapy in Breast Cancer.—Forty-eight women between 26 and 75 with cancer of the breast were treated with testosterone propionate. The drug was given in vegetable oil in doses of 100 mg. three or four times weekly or of 50 mg. daily. The therapy period varied from one month to more than one year. Urinary excretion of 17-ketosteroids, gonadotropic hormones, lactogenic hormone and glycogenic corticoids, and urinary creatine-creatinine ratios were measured. Of the 48 patients, 13 (27%) showed objective regression of the lesions. The regression lasted over an average period of 31.3 weeks, the longest being 50 weeks. In the remaining 35 patients there was either progression or no change. In none of the 10 patients aged less than 40 was a good response obtained, whereas a third of those over 40 showed improvement. The length of time the tumor was present before the institution of testosterone therapy was approximately the same for those showing progression as for those who showed improvement. All patients showed the expected increase in 17-ketosteroid excretion as well as the expected decrease in gonad-stimulating hormone excretion. In the patients who improved, there was a decrease of doubtful significance in urinary corticoids and conversely an increase in corticoids in the patients who did not improve. Excretion of lactogenic hormone (prolactin) for both groups of patients increased. In general, the patients who improved showed a decrease in urinary creatine, whereas those who failed to improve showed an average increase in urinary creatine. Seven patients initially had a lower urinary gonad-stimulating hormone value than expected from their age and endocrine status. The authors believe that the cachexia resulting from the extensive disease in these patients induced a sort of initial physiological hypophysectomy with respect to gonad-stimulating hormone. Six of these seven patients failed to respond favorably to therapy.

Connecticut State Medical Journal, Hartford

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Medicine in Stratford in Its Early Days. S. B. Weld.—p. 305.
Objectives of Psychiatric Hospital. N. D. C. Lewis.—p. 309.
Post-Hospital Infectious Diarrhea of the Newborn. A. Gelperin.—p. 314.
Anthrax—an Industrial Disease. B. S. Dignam.—p. 316.
Anthrax in Connecticut with Case Report. N. T. Phillips.—p. 317.
NPH Insulin: Crystalline Form of Protamine Zinc Insulin. B. Greenhouse.—p. 321.
Preventive Aspects of Chronic Disease. E. M. Cohart.—p. 325.

Endocrinology, Springfield, Ill.

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Effects of ACTH on Metabolism of Radioactive Calcium in Normal and Hypophysectomized Rats. F. Ulrich, D. H. Copp, C. W. Asling and others.—p. 245.
Effect of Induced Ovulation on Pregnancy. H. O. Burdick and M. Crump.—p. 273.
Insulin and Adrenocorticotropin Labeled with Radio-Iodine. J. W. Ferrebee, B. B. Johnson, J. C. Mithoefer and J. W. Gardella.—p. 277.
Some Factors That Influence Release of Iodine from Thyroid Gland. J. Wolff.—p. 284.
Prevention and Reversal Despite Hyperglycemia of Glycogen Infiltration ("Hydropic Degeneration") in Pancreas in Alloxan Diabetes in Rabbit. G. L. Duff and W. E. Toreson.—p. 298.
*Effect of Adrenalectomy in Rat upon Rate of Growth of Transplantable Tumors. D. J. Ingle and B. L. Baker.—p. 313.
Method of Assaying Adrenal Cortical Hormones Based on Decrease in Circulating Eosinophil Cells of Adrenalectomized Mice. R. S. Speirs and R. K. Meyer.—p. 316.
Effect of Hypophysectomy on Uptake of Radioactive Iodine by Thyroid of Rat. R. V. Randall and A. Albert.—p. 327.
The in Vivo Determination of Biological Decay of Thyroidal Radioiodine. A. Albert.—p. 334.

Journal of Bone and Joint Surgery, Boston

33A:279-560 (April) 1951. Partial Index

Vascular Epiphyseal Changes in Congenital Dislocation of Hip: Results in Adults Compared with Results in Coxa Plana and in Congenital Dislocation Without Vascular Changes. W. K. Massie.—p. 284.
*Follow-Up Study of Use of Refrigerated Homogenous Bone Transplants in Orthopaedic Operations. P. D. Wilson.—p. 307.
Subtrochanteric Osteotomy and Spline Fixation for Certain Disabilities of Hip Joint: Preliminary Report. M. Cleveland, D. M. Bosworth and A. D. Pietra.—p. 351.
Diamond-Shaped Graft from Ilium for Non-Union of Tibia. H. C. Blair.—p. 362.
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Fractures of Neck of Femur in Children: Clinical Study. G. Allende and L. G. Lezama.—p. 387.
*Fibrous Dysplasia of Bone. P. Strassburger, C. Z. Garber and H. Hallock.—p. 407.
Fixation of Small But Important Bone Fragments with Hook Plate. W. A. Zuelzer.—p. 430.
Improved Type of Arthroplasty of Hip Joint. A. F. DePalma.—p. 437.
Xanthomatous Joint Tumors. W. L. Minear.—p. 451.
Synovial Sarcomata. J. F. Tillotson, J. R. McDonald and J. M. Janes.—p. 459.
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Transplantation of Tibial Tubercle. D. C. McKeever.—p. 478.
Use of Muscle Relaxants as Aid in Diagnosis and Therapy of Acute Low-Back Disorders. E. B. Schlesinger and F. E. Stinchfield.—p. 480.
Role of Tensile Stress in Mechanism of Femoral Fractures. F. G. Evans, H. E. Pedersen and H. R. Lissner.—p. 485.
Recurrent Subluxation of Ankle: With Special Reference to Peroneal-Nerve Block as Diagnostic Aid. M. L. Clayton, A. W. Trott and R. Ulin.—p. 502.
Infantile Ankylosis of Temporomandibular Joint: Treatment by Resection of Mandibular Condyle. T. F. McManis and E. Dehne.—p. 505.

Refrigerated Homogenous Bone Transplants.—Refrigerated homogenous sterile bone grafts were used for 278 orthopedic operations on 214 patients in the course of three years. Wound infection occurred in four patients (1.4%), and there was loss of the grafts in two (0.7%). In a follow-up study of final results from the refrigerated homogenous bone grafts, 144 patients were traced who had undergone 179 orthopedic operations for a large variety of conditions. On the basis of the number of the operations, results were successful in 80% and unsuccessful in 11%. Fifteen patients had undergone operations too recently for a determination of the results. If four patients in which the failure was unrelated to bone healing are eliminated, the rate of failure can be lowered to 8%. Results were identical with those from the use of autogenous grafts, except that in some instances healing appeared to be somewhat slower. Healing of the grafts took place by a process of invasion, absorption, and replacement similar to that of autogenous bone grafts. With careful technique, homogenous bone grafts may be preserved for long periods of time for surgical use. Such grafts are well tolerated by human tissues, and the risk of infection is no greater than with autogenous grafts. The operation of a bone bank is safe and practical. It offers great advantages to the patient and the surgeon from the standpoint of availability, abundance, and elimination of the necessity of a secondary operation to obtain bone.

Fibrous Dysplasia of Bone.—Four male and five female patients with fibrous dysplasia of bone are reported on. The age of the patients at onset ranged from 15 mo. to 33 yr. Their present ages range from 5 to 48 yr. Experience in these nine cases indicates that the fibrous dysplasia of bone may present a variable clinical picture. There was skin pigmentation of the café au lait type in five of the patients. Sexual precocity was seen only in the two patients with the full syndrome complex, *i. e.*, lesions of the skin, bones, and endocrine system. The number of bones involved ranged from one to 15. The alkaline phosphatase was elevated in two patients. There was only one patient who did not have a fracture at some time during the period of observation. Five of the patients showed deformities ranging from mild coxa vara to severe genu varum. In adults there may be rather extensive lesions in more than one bone without symptoms or serious impairment of function. In five of the nine patients curettage of the bone lesions and packing of the areas with bone chips were carried out. In the three patients with relatively small lesions results were good. In the two patients with large lesions where the abnormal tissue could not be entirely removed, the chips were absorbed on three occasions. In one patient osteotomies were performed to correct the severe bowing. The bone at the site of osteotomy united, but the deformities have begun to recur above the level of the osteotomies. In the usual case a summation of clinical, roentgenographic, and microscopic findings is desirable for diagnosis of this disease. When islands of cartilage are present, the diagnosis can be made on the basis of the gross or microscopic examination alone.

Journal of Experimental Medicine, New York

93:297-414 (April) 1951. Partial Index

Lipolytic Enzyme in Reactive Histiocytes of Guinea Pigs with Experimental Encephalomyelitis. F. S. Vogel.—p. 305.

Effect of Liver Regeneration on Tumor Formation in Rats Fed 4-Dimethyl-Aminoazobenzene. A. D. Glinos, N. L. R. Bucher and J. C. Aub. —p. 313.

Mechanism of Proteinuria: III. Comparison of Functional and Structural Aspects of Effects of Certain Intraperitoneally Administered Proteins on Hemoglobin Excretion in Rat. R. W. Lippman, H. J. Ureen and J. Oliver.—p. 325.

Role of 1-Methionine in Virus Propagation. W. W. Ackermann.—p. 337.

Determination of Inherited Traits of H. Influenzae by Desoxyribonucleic Acid Fractions Isolated from Type-Specific Cells. H. E. Alexander and G. Leidy.—p. 345.

Sustained Hypertension Following Administration of Desoxycorticosterone Acetate. S. M. Friedman, C. L. Friedman and M. Nakashima.—p. 361.

Sustained Hyperlipemia Induced in Rabbits by Means of Intravenously Injected Surface-Active Agents. A. Kellner, J. W. Correll and A. T. Ladd.—p. 373.

Elaboration of Desoxyribonuclease by Streptococci in Resting State and Inhibition of Enzyme by Substance Extractable from the Cocci. A. W. Bernheimer and N. K. Ruffier.—p. 399.

Journal Lab. and Clinical Medicine, St. Louis

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Effect of Desoxycorticosterone and Propylene Glycol in Experimental Hypertension. W. D Davis Jr., A. Segaloff, W. S. Jacobs and J. B. Callahan.—p. 499.

Effects of Potassium Salts in Subjects with Heart Disease. H. Brown, G. L. Tanner and H. H. Hecht.—p. 506.

Significance of Decreased Dye Clearance by Liver Following Portacaval Anastomosis. J. F. Laws and T. C. Everson.—p. 515.

Serum Alkaline Phosphatase in Dogs Following Ligation of Hepatic Veins. J. Mithoefer and S. Rapoport.—p. 520.

Alkaline Phosphatase of Cell Nuclei. G. Gomori.—p. 526.

Serum Lipid and Protein Fractions: III. Diseases of Mesenchyme. I. Leinwand.—p. 532.

Serum Proteins in Pregnancy: Thermal Coagulation and Binding of Anions. G. H. Miller Jr., E. Davis, A. G. King and C. B. Huggins. —p. 538.

Relationship of Xanthoproteic Indices to Quantitative Phenol Levels in Various Azotemic States. P. Gaberman, D. H. Atlas, J. Isaacs and others.—p. 544.

Salt Losing Conditions: Renal Defect in Tuberculous Meningitis. S. Rapoport, C. D. West and W. A. Brodsky.—p. 550.

Influence of Nucleic Acid upon Fluorescence of Nuclei and Cytoplasm After Injection of Aromatic Diamidines. I. Snapper, B. Schneid, F. Lieben and others.—p. 562.

Nonspecific Inhibition by Serum and Urine in Microbiologic Assay of Antibiotics. R. B. Gerstung.—p. 575.

Toxic Effect of Buffered Saline Solutions on Viability of Brucella Abortus. G. C. de Mello, I. S. Danielson and J. S. Kiser.—p. 579.

*Effect of Combinations of Antibiotics on Pseudomonas Aeruginosa and on Proteus Vulgaris, in Vitro and in Vivo. C. W. J. Armstrong and A. E. Larner.—p. 584.

Eosinophile Response in Chronic Disease and Malnutrition. L. O. Brenner, S. O. Waife and M. G. Wohl.—p. 593.

*Some Observations on L. E. Cell. A. Suksta and C. L. Conley.—p. 597.

Adrenocorticotrophic Hormone (ACTH) in Treatment of Experimental Air-Borne Influenza Virus Type A Infection in Ferret. R. B. Hull and C. G. Loosli.—p. 603.

Effect of Cortisone on Pathologic Responses of Guinea Pigs Infected Cutaneously with Fungi, Viruses, and Bacteria. A. M. Kligman, G. D. Baldridge, G. Rebell and D. M. Pillsbury.—p. 615.

Effect of Combinations of Antibiotics.—In vitro and in vivo tests were made of the sensitivities of seven strains of Pseudomonas aeruginosa and four strains of Proteus vulgaris to various concentrations of aureomycin, chloramphenicol, penicillin, dihydrostreptomycin, and terramycin, singly and in combination. The in vitro tests on Ps. aeruginosa showed that in certain combinations the bactericidal properties of the drugs were increased. There was a pronounced reduction in concentration of antibiotic required for the aureomycin-terramycin and the chloramphenicol-terramycin combinations. A combination of penicillin with dihydrostreptomycin resulted in a reduction of the bactericidal concentrations required of each, but these were still relatively high. The triple combination of aureomycin-dihydrostreptomycin-terramycin also showed great reduction in required concentration; however, this combination is not recommended, since aureomycin and terramycin are effective without dihydrostreptomycin, which leads rapidly to resistance in the organism. The results with penicillin in dual combinations did not appear to justify its trial in triple combinations. There was one case of apparent drug antagonism; i. e., the chloramphenicol-penicillin combination required higher concentrations of the antibiotics than when the drugs were used alone. In the in vitro sensitivity tests on the four strains of Ps. vulgaris aureomycin-dihydrostreptomycin and dihydrostreptomycin-terramycin showed significant decreases. Triple combinations were again less promising, with the exception of aureomycin-dihydrostreptomycin-terramycin, which required a much smaller concentration than when the drugs were given alone. No antagonism between the drugs was noted in these combinations. The most promising in vitro combinations for Ps. aeruginosa were also effective in vivo. The dual combinations were especially effective. Treatment with an aureomycin-chloramphenicol-terramycin combination was tried without particular benefit. Antibiotic combinations including dihydrostreptomycin were used for in vivo experiments with P. vulgaris. For some unknown reason a mixed culture of P. vulgaris strains that were individually resistant to dihydrostreptomycin *in vitro proved to be very sensitive to dihydrostreptomycin* in experimentally infected mice. The authors suggest that in each case the drug or combination of drugs used should be determined by preliminary laboratory investigation.

Observations on L. E. Cell.—Smears of heparinized blood or marrow from 115 patients with various diseases were examined for L. E. cells. The cells were found in 14 of 21 cases of disseminated lupus erythematosus but were not observed in any other condition (i. e., periarteritis nodosa, acute rheumatic fever, rheumatoid arthritis, thrombopenic purpura, multiple myeloma, and dermatitis medicamentosa). The number of L. E. cells and rosettes found on examination of the heparinized blood buffy coat smears roughly paralleled the number occurring in the heparinized marrow buffy coat preparations from the same patient. In the patients with acute disseminated lupus erythematosus who were treated with pituitary adrenocorticotropic hormone (ACTH) or cortisone, the number of L. E. cells and rosettes present in the blood decreased but did not disappear during therapy. There was no apparent relation between the total white blood cell count and the number of L. E. cells seen in the buffy coat smears. It was further demonstrated that L. E. cells may be formed in the absence of anticoagulant. The authors did studies to determine the period of time required for the formation of L. E. cells. Their formation was completely inhibited by low temperatures, and after blood had been chilled at least 10 min. of incubation at 37 C. was required for them to form. In all the specimens incubated at 37 C. for one minute or longer, extracellular material closely resembling the homogeneous, purplish mass seen in L. E. cells was observed. Incubation of heparinized blood for 15 minutes at 37 C. appeared adequate for optimal L. E. cell production.

Journal-Lancet, Minneapolis

71:123-168 (April) 1951

Tuberculosis at the Mid-Century. R. H. Frost.—p. 124.

Controlling Tuberculosis in a New Nation: 1950 Journal-Lancet Lecture. J. A. Myers.—p. 127.

Development of Upright Balanced Fluoroscopic Unit in Minnesota. E. L. Tuohy.—p. 132.

Continuity of Program—Necessity in Tuberculosis Control Among American Indians. H. DeLien.—p. 136.

Animal Infections in Man. P. S. Dodd.—p. 138.

The Forgotten Test. J. F. Briggs.—p. 140.

Tuberculosis Problems in Kent County, Michigan. H. D. Ireland.—p. 142.

Diagnosis and Surgical Treatment of Congenital Heart Disease. W. J. Potts.—p. 145.

Controlling Tuberculosis on the College Campus: Panel Discussion. L. J. Moorman, J. W. Middleton, H. A. Kemp and E. Strauss.—p. 152.

Journal of Nervous and Mental Disease, New York

113:189-282 (March) 1951

Some General and Neurologic Aspects of Atomic Medicine. D. I. Arbuse.—p. 189.
*Accident Proneness in Multiple Sclerosis: Relationship to Trauma, with Medicolegal Implications. A. E. Bennett.—p. 198.
Modification of Electroshock Convulsion by Means of Curare, Intravenous Barbiturate and Airway. M. Brody.—p. 211.
Facialgia (Atypical Facial Neuralgia): Report of Cases Associated with Tic Douloureux. A. A. Raney, R. B. Raney and C. R. Hunter. —p. 223.
Treatment of Schizophrenia: Comparison of Three Methods: Brief Psychotherapy, Insulin Coma and Electric Shock. J. S. Gottlieb and P. E. Huston.—p. 237.
Further Observations on 62 Lobotomized Psychotic Male Veterans at the Veterans Hospital, Northport, New York. L. Drubin.—p. 247.

Accident Proneness in Multiple Sclerosis.—Bennett reviews the literature and discusses three cases from his own medicolegal records on the relationship between trauma and multiple sclerosis. Although medical evidence is against the theory that trauma causes or exacerbates multiple sclerosis, compensation courts are granting large awards to such claimants. Reasons for this seem to be the failure to understand the course of the disease, with its spontaneous remissions and progressive pathology; the peculiar type of personality changes, manifested in euphoria, overconfidence, and poor judgment; the symptoms of motor paresis, ataxia, and disturbed equilibrium. These factors make patients with multiple sclerosis more prone to have accidents and to accept them as causing or aggravating their symptoms. The efforts of an adroit attorney, together with a sympathetic judge, enable the claimant often to obtain a large, unjustified award for total permanent disability. There is increasing need for a unified medical opinion to guide courts in these decisions. Neurologists have too often certified that an accident aggravated existing symptoms. The hypothetical question, a favorite legal device, undoubtedly biases opinion, since it can be and frequently is so worded that the expert has to admit that trauma as an etiological factor lies within the realm of possibility. A free, unbiased statement of the medical evidence should replace the hypothetical question. Expert witnesses, drawn from a panel of qualified neurologists, should replace the present method of retaining one or more experts expected to render favorable opinions to the side retaining them.

Journal of Pediatrics, St. Louis

38:411-536 (April) 1951

*Pertussis: Clinical Comparison of Newer Antibiotics. C. E. Booher, J. B. Farrell and E. J. West.—p. 411.
Terramycin in Treatment of Pneumonias of Childhood: Report of 10 Cases. C. H. Wooding Jr. and R. B. Scott.—p. 423.
Treatment of Typhoid Fever with Terramycin. W. A. Reilly and A. M. Earle.—p. 428.
Congenital Valvular Pulmonary Stenosis With or Without Interatrial Communication: Physiologic Studies as Diagnostic Aids. F. H. Adams, L. G. Veasy, J. Jorgens and others.—p. 431.
Unusual Anomaly of Aortic Arch. A. Goldwyn.—p. 442.
*Role of Rh Factor in Etiology of Cerebral Palsy. I. P. Sobel and H. S. Wilhelm.—p. 447.
Significance of Delayed Development in Diagnosis of Cerebral Palsy. E. Denhoff and R. H. Holden.—p. 452.
Epidemic Diarrhea of Infancy. A. D. Rubenstein and S. A. Britten. —p. 457.
Technique of Pneumoencephalography in Children: Comparative Results with Air and Oxygen Injection. L. Casamajor, R. W. Laidlaw and P. J. Kozinn.—p. 463.
Anomalous Anal Papillae in Infants and Children. S. J. Nichamin and H. I. Kallet.—p. 468.
Modern Concept of Breast Feeding. M. I. Levine.—p. 472.
Emotional Reactions and Behavior of Children in the Home: Method of Study. R. Winkley, K. Jackson, O. A. Faust and others.—p. 476.
Chart on Eruption of Deciduous Teeth for the Pediatrician's Office. H. V. Meredith.—p. 482.
New Suckling Device for Artificial Infant Feeding. R. D. Hawkins. —p. 484.
Self-Lubricating Syringe. A. Bloxsom.—p. 491.
*Twin Fetuses in Fetu. R. E. Gross and H. W. Clatworthy Jr.—p. 502.

Antibiotics in Pertussis.—The comparative clinical effectiveness of streptomycin, aureomycin, chloramphenicol, and terramycin was studied in 160 cases of uncomplicated pertussis. Streptomycin appeared to be of only questionable value, but the remaining three antibiotics were equally effective in shortening the duration of the whooping stage. Chloramphenicol and terramycin also significantly shortened the duration of fever. The effective minimum dose for aureomycin, chloramphenicol, and terramycin was 50 mg. per kilogram of body weight per day. At this dose the antibiotics were well tolerated. There was no therapeutic advantage in giving the drugs in combination. In patients seen after this study there seemed to be increased bacterial resistance to these antibiotics. The authors conclude that the ideal drug for the treatment of pertussis has not been developed.

Rh Factor and Cerebral Palsy.—The authors studied 98 children with cerebral palsy and their mothers to determine whether isoimmunization to the Rh or ABO blood factors played an important role in the production of this condition. The percentage of Rh-negative mothers and Rh-positive children in the group was approximately the same as found in the general population, but three of the children had erythroblastosis fetalis, a somewhat higher incidence than in the general population. ABO blood group incompatibility was found in a lower proportion of these families than in families with normal children. The authors conclude that maternal isoimmunization to the Rh factor plays only a slight role in the etiology of cerebral palsy.

Twin Fetuses in Fetu.—This is a report of a very unusual type of retroperitoneal teratoma, consisting of twin fetuses, occurring in a newborn infant. The infant was admitted to the hospital at the age of two days because of regurgitation and the presence of a fist-sized abdominal mass. Roentgenograms of the abdomen showed a moderate amount of amorphous bone and an almost complete fetal skeleton in the center of the mass. Surgical excision was performed, and the mass was found to consist of two membranous sacs containing two partially developed fetuses. Recovery was complete following operation, and the child developed normally during a three and one-half year observation period. A fetus in fetu does not arise from fertilization of an ovum within a child. Instead it represents a splitting off of cells from a developing embryo, the growth of which produces a teratoma. Complete excision of the entire growth, including the membranes, is essential for cure, since remnants invite local recurrence or metastatic spread. Radiation therapy is not curative in these cases.

Journal of Urology, Baltimore

65:351-496 (March) 1951. **Partial Index**

Multilocular Cysts of Kidney. T. H. Frazier.—p. 351.
Dissecting Aneurysm of Abdominal Aorta Simulating Renal Disease: Case Diagnosed Ante-Mortem. H. A. Kontoff and B. R. Sears. —p. 364.
Diagnosis of Involvement of Inferior Vena Cava in Renal Neoplasms. P. A. Duff and W. H. Granger.—p. 368.
Thrombo-Angiitic Occlusion of Renal Artery with Resultant Hypertension. S. Malisoff and M. B. Macht.—p. 371.
Lymphoblastomatous Nephropathy. C. H. deT. Shivers and H. D. Axilrod.—p. 380.
Cutaneous Metastases from Transitional Cell Carcinoma of Renal Pelvis and Bladder. L. K. Mantell and G. R. Hamilton.—p. 386.
Repair of Exstrophy of Bladder. T. N. Hepburn.—p. 389.
Exstrophy of Bladder Complicated by Adenocarcinoma. R. Goyanna, J. L. Emmett and J. R. McDonald.—p. 391.
Myosarcoma of Bladder. G. M. Fister and A. J. Lund.—p. 401.
Functional Results Following Transurethral Resection and Retropubic Prostatectomy. H. C. Rolnick and M. A. Robbins.—p. 408.
Retropubic, Extra-Urethral and Extravesical Prostatectomy. H. B. Schwartz.—p. 416.
Osteitis Pubis. E. F. Hock and K. A. Kurtz.—p. 419.
Flaqué-Lowsley Operation for Urinary Incontinence: Preliminary Report. A. Vergés-Flaqué.—p. 427.
Female Pseudohermaphroditism with Supplementary Phallic Urethra: Report of Two Cases. F. S. Howard and F. Hinman Jr.—p. 439.
Paraffinoma of Penis: Case Report. R. H. Bradley Jr. and W. A. Ehrgott.—p. 453.
Carcinoma of Cowper's Gland. W. A. Griesau and D. Lipphard. —p. 460.
Sperm Survival at Estimated Ovulation Time: Comparative Studies in Morphology: Preliminary Report. M. R. Cohen and I. F. Stein. —p. 467.
New Chemical Approach to Dissolution of Urinary Calculi. R. F. Gehres and S. Raymond.—p. 474.
*Penicillium Infection of Urinary Tract. J. S. Gilliam Jr. and S. A. Vest.—p. 484.

Penicillium Infection of Urinary Tract.—This paper concerns the occurrence of a Penicillium mold in man as a pathogen. The patient was an entomologist, 56, who for many years had had episodes of colicky right flank pain, coming on suddenly and sometimes lasting for several days. The pain, usually beginning over the kidney region and radiating down the course of the ureter, was accompanied by mild fever and malaise and was followed in a few hours by the passage of balls of pink material in the urine. Following this there was a remission of the fever and no further symptoms until the occurrence of another attack, some months later. The attacks seemed to be more frequent in fall and winter. The pink material in the urine was identified by the authors as a large mass of mycelium. Cultures from the kidneys obtained by ureteral catheterization revealed a mold that was present only in the urine from the right side. Pure cultures of the mold were identified as Penicillium citrinum, one of the 200-odd species of Penicillium. There was little evidence that serious kidney damage had occurred from this unusual infection over the past 12 years. There was only moderate reduction in renal function, and the pyelographic evidence of pyelonephritis in the affected kidney was not pronounced. This particular Penicillium produced little if any antibiotic substances on culture. It possibly produced a weak antibiotic in vivo, as the urinary tract had remained sterile. No chemotherapeutic agent has been found to which this fungus will respond. The patient died elsewhere, and cultures taken at autopsy showed Penicillium in the bladder and right kidney.

Kentucky Medical Journal, Bowling Green

49:97-138 (March) *1951*

Glomerular Nephritis. L. H. Winans.—p. 97.
Review of Cesarean Section in Small Hospital. S. H. Flowers.—p. 104.
Tracheo-Esophageal Fistula in the New-Born—Surgical Repair. J. R. Bryant.—p. 108.
Cutaneous Blastomycosis. R. L. Cash.—p. 110.
Homologous Serum Jaundice Treated Successfully with Aureomycin. K. L. Lockwood.—p. 116.

49:139-188 (April) 1951

*Vagotomy and Pyloroplasty: Physiologic Treatment for Duodenal Ulcer. H. E. Dorton and J. G. Webb.—p. 139.
Central Serous Retinosis and Its Relation to Other Acquired Impairments of Central Vision. A. H. Keeney.—p. 148.
Chronic Amebiasis: Diagnosis and Treatment. R. A. Radke.—p. 153.
Hemangioma of Ileum with Intussusception. R. H. Weddle.—p. 158.
Perforation of Interventricular Septum Following Myocardial Infarction. B. M. Kaplan, J. H. Mahaffey and H. L. Clay.—p. 161.

Vagotomy and Pyloroplasty for Duodenal Ulcer.—Eighty-five to 90 per cent of patients with duodenal ulcer can be managed satisfactorily by medical measures. In intractable or complicated cases gastric resection yields good results in about 90% of patients. However, Dorton and Webb feel that the mutilating nature of the procedure, together with its magnitude, risk (2 to 3% mortality), and a 5 to 10% incidence of marginal ulceration, justifies the search for a simpler and safer method. They feel that vagotomy combined with pyloroplasty is such a method. They selected pyloroplasty as the drainage procedure to accompany vagotomy for the following reasons: 1. It relieves pylorospasm, which is probably a contributing factor in the production of duodenal ulcer. 2. Pyloroplasty permits direct inspection and local removal of the scarred ulcer area. 3. The approach can be used to control a bleeding vessel. 4. Pyloroplasty has the advantage of Billroth 1 procedure: anastomotic ulceration cannot occur. 5. Pyloroplasty prevents strictures at the outlet of the stomach as the ulcer heals. It also permits ready emptying of the stomach during the immediate postoperative period, when the stomach is temporarily atonic from the recent gastric neurectomy. 6. Pyloroplasty is much simpler to perform than gastroenterostomy and has a lower morbidity. 7. Pyloroplasty does not alter the basic anatomic arrangement of the stomach. 8. Finally, since pyloroplasty alone will cure only 20% of ulcers, the curative effect of vagotomy would be less obscured than if gastroenterostomy, which cures 70 to 80%, was used. Twenty-two patients with proven intractable or complicated duodenal ulcers were treated by vagotomy and pyloroplasty. Twenty-one (95.4%) of these patients have had excellent results.

Missouri State Medical Assn. Journal, St. Louis

48:161-264 (March) 1951

Coarctation of Aorta: Report of Four Cases Operated upon. C. P. Lynxwiler, S. Smith, J. L. Lucido and J. J. Inkley.—p. 177.
Factors in Psychotherapeutic Success. I. N. Mensh and J. M. Golden.—p. 180.
Streptomycin in Treatment of Pulmonary Tuberculosis: Some General Considerations. P. Murphy.—p. 187.

New England Journal of Medicine, Boston

244:495-536 (April 5) *1951*

*Treatment of Chronic Human Amebiasis with Aureomycin. W. H. Hall.—p. 495.
Carcinoma of Bladder: Evaluation of Total Cystectomy and Other Methods of Treatment. F. H. Colby and W. S. Kerr Jr.—p. 504.
Importance of High-Pitched Squeaking Systolic Murmur in Diagnosis of Aortic Stenosis and Calcification of Aortic Valve. H. A. Braun and W. J. Comeau.—p. 507.
*Rickettsialpox in Boston: Report of Case. J. Franklin, E. Wasserman and H. S. Fuller.—p. 509.
Medicine as Science: Microbiology. D. L. Belding.—p. 511.

Aureomycin in Chronic Amebiasis.—In vitro studies demonstrated that aureomycin hydrochloride killed the trophozoites of Endameba histolytica in concentrations as low as 50 γ per cubic centimeter. Although this effect was undoubtedly in part the consequence of an alteration of bacterial flora, there was evidence that aureomycin also directly attacked the amebas. Twenty patients with amebiasis, 10 with chronic amebic dysentery, six amebic cyst passers or carriers, and four with amebic hepatitis or amebic abscess were treated with aureomycin hydrochloride by mouth. The dose given was 0.5 gm. every six hours for 10 days. In the 10 patients with chronic amebic dysentery the parasites usually disappeared from the stools within 24 hr. after the first dose, although, in two patients, 48 to 72 hr. of treatment was required before the parasites disappeared. Seven of the 10 patients remained asymptomatic for three to 14 mo. after treatment was discontinued. One patient had recurrent symptoms, another required two courses of treatment before his symptoms disappeared. In a patient with regional ileitis paralytic ileus developed during aureomycin therapy and required surgical excision of the involved ileum. After 24 to 72 hr. of treatment cysts could no longer be observed in the feces of the six patients who had passed cysts of Endameba histolytica in their feces before treatment. No parasites were found in formed or purged stools of any of these patients for an average of six months after treatment. Only one of the three patients with amebic hepatitis became asymptomatic and free of amebas on stool examination after a single course of aureomycin. One other patient, with liver abscess, showed no symptomatic benefit from aureomycin, although the amebas disappeared from his feces. At present it appears that aureomycin should not be used alone in the presence of hepatic amebiasis but should be supplemented by emetine hydrochloride or chloroquine phosphate or both. No serious toxic effects of aureomycin were noted, although it caused minor gastrointestinal disturbances in several patients.

Rickettsialpox in Boston.—The natural occurrence of rickettsialpox is reported in a housewife, 46, in Boston. The diagnosis was established by the typical clinical and laboratory observations, including a significantly elevated complement fixation titer. Systemic symptoms were noted three days after detection of the primary lesion, an area of induration and erythema with a central black crust on the dorsal surface of the right thenar eminence. Temperature was restored to normal after six days of fever, the highest recorded level reaching 103 F. Severe frontal headache was one of the chief complaints. An irregularly scattered, discrete, slightly erythematous maculopapular eruption over the chest, abdomen, and back appeared on the fourth day after fever was first noted. During both the acute and the convalescent phases of the illness, results of tests for heterophil antibody were negative. The complement fixation titer rose from zero during the acute phase of illness to a level of 1:320 during convalescence, three weeks after the appearance of the primary cutaneous lesion and 19 days after onset of fever. The patient recovered promptly without specific treatment. This is the second naturally occurring case of rickettsialpox diagnosed in Massachusetts. It probably indicates a second focus of natural infection within the city of Boston.

Oklahoma State Medical Assn. J., Oklahoma City

44:81-122 (March) 1951

Recent Advances in Treatment of Cerebral Thrombosis. W. N. Weaver.—p. 84.
Traumatic Injuries of Thorax. E. Fair.—p. 86.
Carcinoma of Lung. J. W. Gale.—p. 89.
Deep Infection of Neck. R. E. Stuart.—p. 93.
Accidental Electrocution. P. A. Sugg.—p. 97.

Public Health Reports, Washington, D. C.

66:387-422 (March 30) 1951

Potentialities of Biological Warfare Against Man—Epidemiological Appraisal. A. D. Langmuir.—p. 387.
Environmental Health: Critique. M. D. Hollis.—p. 400.

66:423-454 (April 6) 1951

Community-Wide Chest X-Ray Survey: IV. Diagnostic Clinic. D. Reisner and A. Rikli.—p. 423.

66:455-486 (April 13) 1951

Isolation and Characterization of Rocky Mountain Spotted Fever Rickettsiae from Rabbit Tick Haemaphysalis Leporis-Palustris Packard. R. R. Parker, E. G. Pickens, D. B. Lackman and others.—p. 455.
Rabbit-Ear Cage for Bloodsucking Arthropods. P. A. Woke.—p. 464.

Quarterly J. Studies Alcohol, New Haven, Conn.

12:1-166 (March) 1951

Effects of Alcohol on Conflict Behavior in Albino Rat. J. J. Conger.—p. 1.
Mechanism of Action of Tetraethylthiuram Disulfide in Alcoholism: Iron as Antidote for TETD-Alcohol Reaction. J. A. Christensen.—p. 30.
Effect of Tetraethylthiuram Disulfide on Metabolism of Ethyl Alcohol. H. W. Newman and H. V. Petzold.—p. 40.
Estimation of Methyl and Ethyl Alcohol from Current-Voltage Oxidation Curves. W. M. MacNevin and T. R. Sweet.—p. 46.
Role of Psychiatry in Field of Alcoholism: With Comment on Concept of Alcoholism as Symptom and as Disease. H. M. Tiebout.—p. 52.
New Attitudes Toward Alcoholism. L. A. Osborn.—p. 58.
Attic Temperance. A. P. McKinlay.—p. 61.
Group Therapy in Alcoholism: Transcriptions of Series of Sessions Recorded in Outpatient Clinic. R. G. McCarthy.—p. 103.

Rocky Mountain Medical Journal, Denver

48:229-316 (April) 1951

Acute Appendicitis. P. Thorek.—p. 255.
Diagnosis: Psychoneurosis—What Happens Now? J. M. Lyon.—p. 262.
Experiences with Antabuse: Preliminary Report. F. A. O'Donnell, E. J. Brady and R. W. Davis.—p. 268.

Urologic & Cutaneous Review, West Palm Beach, Fla.

55:193-256 (April) 1951

Subcutaneous Urography: Description of New Method Utilizing 70% Urokon and Hyaluronidase (Preliminary Report). J. E. Byrne and W. F. Melick.—p. 193.
Cancer of Prostate Gland: Fourth Interim Report. R. P. Beatty and A. E. Wright Jr.—p. 199.
*Rapid Treatment of Acute Gonorrhea in Males with Oral Aureomycin. L. T. Wright, W. I. Metzger, M. S. Beinfield and others.—p. 203.
Chloromycetin in Treatment of Bacillary Urinary Infections. W. M. Wilson, R. W. Barnes and R. T. Bergman.—p. 206.
"L. E." Cell Phenomenon and in Vitro-Cortisone. T. Cornbleet and F. T. Flood.—p. 208.
Blastomycosis en Plaque. J. C. Sodaro and C. J. White.—p. 209.
Modern Concepts of Rhinoplastic Surgery. W. A. Marmor.—p. 209.
Peculiar Scars of Upper Lid, New Type of Disease in China. A. Fuchs.—p. 213.

Aureomycin in Acute Gonorrhea.—Sixty-three Negro male patients between the ages of 14 and 56 with acute gonorrhea were treated with aureomycin. A single capsule containing 500 mg. of aureomycin was given initially and a second 500 mg. capsule six hours later. The clinical follow-up showed that the course of the disease was strikingly uniform in these patients. Within 24 hr. bacteriologic smears and cultures were negative in most cases, and the thick, purulent discharge had disappeared completely, although some patients still had a thin, watery discharge that was free of gonococci. After 48 hr. the urethral discharge had completely disappeared. Sixty patients (95.2%) with adequate clinical follow-up were cured; that is, there were negative smears and culture and no clinical symptoms. The remaining three patients were therapeutic failures. With the dose used toxic reactions were minimal and high urine levels of aureomycin were obtained, which persisted for at least 48 hr. in three of four patients. The results showed that aureomycin is as effective as penicillin in the treatment of acute gonorrhea. Aureomycin possesses the following advantages: ease of administration; minimal toxicity limited to the gastrointestinal tract; little or no increased drug resistance of the gonococci; beneficial effect in concurrent gram-negative bacterial urinary tract infections sometimes associated with gonorrhea. Aureomycin should be considered one of the agents of choice in the treatment of acute gonorrhea.

Virginia Medical Monthly, Richmond

78:167-222 (April) 1951

Lung Resection for Tuberculosis. F. P. Coleman and H. J. Hancock.—p. 169.
Rehabilitation of Genitourinary Malformations. W. H. Boyce and S. A. Vest.—p. 176.
Early Medicine in the Old Dominion. M. P. Rucker.—p. 181.
Ocular Torticollis: Report of Case. H. G. Preston.—p. 187.
Experiences with New Types of Insulin. T. S. Edwards, F. V. Vance Jr. and H. B. Mulholland.—p. 190.
Complications of Bronchiectasis. J. T. Phillips Jr.—p. 194.

West Virginia Medical Journal, Charleston

47:107-140 (April) 1951

*Duodenal Obstruction in the Newborn. J. O. Rankin.—p. 107.
*Histoplasmosis. H. Fischer, A. R. Marks, J. E. Wilson and R. Hathaway.—p. 114.
Needed: More Blood. K. R. Nelson.—p. 120.
Acute Abdomen. P. Thorek.—p. 122.

Duodenal Obstruction in Newborn Infants.—Five newborn infants with obstruction of the duodenum were operated on during the past year. The obstructing mechanism was extrinsic in three instances and intrinsic in two. Two patients died, one on the 11th postoperative day, and the other, who was operated on twice, died 24 hours after the second operation. The three other patients made an uneventful recovery. Complete obstruction of the duodenum is a fatal condition unless an early diagnosis is made and adequate surgery is instituted. Vomiting, dehydration, and constipation in the newborn, with a distended mass in the epigastrium and a flat hypogastrium should lead the physician to suspect the true diagnosis. Roentgen examination will reveal a dilated stomach and proximal duodenum, with failure of barium to pass into the jejunum at the end of six hours. Intestinal gas patterns will be absent if the obstruction is complete. Proper preoperative and postoperative care, with replacement of fluids, electrolytes, and blood, and the use of antibiotics will definitely influence the mortality rate.

Histoplasmosis.—The first case of histoplasmosis in West Virginia is reported. The patient was a white female aged 21 months. Physical examination revealed moderately enlarged anterior and posterior cervical lymph nodes. Both the liver and the spleen were palpated two fingerbreadths below the costal margin. The temperature was of the spiked septic type. Tuberculin tests gave negative results. Positive cultures of Histoplasma capsulatum were obtained from the feces, throat, and urine before death, making diagnosis possible before autopsy. The mouth was suspected to be the portal of entry. Cultures obtained of a lymph node taken at autopsy showed the pathogenic agent. A histoplasmosis complement fixation test gave positive results in a titer of 32. A lowered total serum protein level was noted. Treatment, including aureomycin therapy, was ineffective.

Wisconsin Medical Journal, Madison

50:325-416 (April) 1951

Surgical Management of Carcinoma of Colon. F. D. Weeks.—p. 346.
Incidence of Amebiasis in Large General Hospital in Wisconsin: Problem of Carrier State. J. M. Lubitz and J. P. Conway.—p. 353.
Vein Stripping Versus Multiple Ligations. J. M. Sullivan and W. F. Merdinger.—p. 357.
Recent Advances in Anesthesiology. S. C. Cullen.—p. 361.
Combined Operations. L. A. Osborn.—p. 365.
Place of Radiation in Treatment of Intracranial Tumors. H. D. Kerr.—p. 377.

Yale Journal of Biology and Medicine, New Haven

23:361-444 (April) 1951

Adrenal-Hyaluronidase Relationship in Infection. G. H. Smith and J. C. Opsahl.—p. 361.
Ailments and Physicians of Dr. Johnson. P. P. Chase.—p. 370.
Circulatory Changes in Chronic Pulmonary Disease: Study of Pulmonary Collateral Circulation. F. D. Gray Jr., P. R. Lurie and R. Whittemore.—p. 380.
Motor Neuron Development in Spinal Cord Following Removal of Alar Plate and Spinal Ganglia. N. K. Mottet.—p. 390.
Unusual Brachial Plexus Formation. A. Chetrick and L. R. M. Del Guercio.—p. 395.
Chorionic Gonadotrophin, ACTH, and Adrenal-Hyaluronidase Relationship. J. C. Opsahl, C. N. H. Long and E. G. Fry.—p. 399.
Action of Penicillin on Growth Response of Gram-Negative Bacillus to Amino Acids and Peptides. S. Simmonds and J. S. Fruton.—p. 407.

FOREIGN

Archives des Maladies du Coeur, Paris

44:193-288 (March) 1951. **Partial Index**

Classification of Anomalies of Pulmonary Artery and Its Branches. A. Castellanos and O. Garcia.—p. 193.

Comparison of Rapidity of Occurrence of Dense Shadows, of Clinical Signs and of Pathological Anatomy in Spontaneous Course of Chronic Peripheral Arteritis. H. Reboul and P. Laubry.—p. 209.

*Results of Ligation of Inferior Vena Cava in 50 Cases of Irreducible Cardiac Decompensation. E. Donzelot, F. d'Allaines, R. Heim de Balsac and others.—p. 239.

Ligation of Inferior Vena Cava.—Ligation of the inferior vena cava was performed on 50 patients with irreducible cardiac decompensation, of whom 38 had mitral lesions, nine had hypertension, two had aortic lesions, and one had myocardial infarction. Ten patients died within the first two postoperative weeks; in four of them the operation was performed as a last resort. The indication for the operation was apparently erroneous in one patient with calcified aortic stenosis and pulmonary edema, and death resulted from accidents in the remaining five patients. Immediate satisfactory results were obtained in 38 of the 40 surviving patients. Orthopnea and nocturnal paroxysmal dyspnea disappeared, but the objective element of the clinical picture were influenced to a lesser degree. Two patients were not benefited by the operation. Of the 38 who were benefited five showed only slight and transitory improvement, while 33 showed significant and more persistent improvement during a follow-up period of four to 17 months. Twenty-one of the 33 patients were able to lead fairly normal lives: seven returned to factory work, five had to make an occupational change, and nine were able to do housework. In all these patients the persistent disappearance of the functional disturbance was the dominant feature. Nine patients died within three to 13 months after the operation, of whom four had been improved by the operation and one had resumed his former occupation. Death resulted from hemiplegia in four, from cardiac decompensation in two, from nephritis in two, and from repeated surgical intervention in one. Ligation of the inferior vena cava is to be considered only a palliative operation, but it may bring about persistent relief. The best results were obtained in patients with definite cardiac decompensation who still responded to rest and cardiotonics, i. e., in patients whose myocardium is still capable of recovery. With improved surgical technique (transperitoneal approach) and with less early postoperative heparinization the mortality rate should decrease. Conservative and surgical treatment do not exclude one another, but the latter may complete the first if performed at a favorable time in carefully selected cases.

Archivos de Pediatría del Uruguay, Montevideo

22:1-84 (Jan.) 1951. **Partial Index**

*Tuberculous Meningitis Cured by Streptomycin. P. Cantonnet Blanch, A. Pérez Scremini and E. Katz.—p. 18.

*Treatment of Purulent Meningitis in Infants Without Use of Intraspinal Route: Results Obtained in Montevideo. J. Bonaba and J. A. Portillo. —p. 33.

Tuberculous Meningitis Cured by Streptomycin.—A boy, 10, in the course of three years after occurrence of primary tuberculous infection successively had tuberculous pleurisy, ascites, and bilateral spread of pulmonary tuberculosis, which were controlled by the administration of dihydrostreptomycin, in a daily dose of 1 gm. up to a total dose of 40 gm. Four months later, the tuberculous meningitis developed. The diagnosis was confirmed by the positive results of cultures and inoculation of the cerebrospinal fluid in animals. The disease was cured by dihydrostreptomycin, given intramuscularly in a dose of 2 gm. daily and, later on, of 25 mg. three times a week, up to a total dose of 372 gm. in six mo. The intraspinal dose was 50 mg. at four day intervals, up to a total dose of 1.80 gm. for the first few weeks of the disease. The drug was well tolerated by the intramuscular route but not by the intraspinal route. Cure has been maintained up to the present (four months after treatment).

Purulent Meningitis in Infants.—Bonaba and Portillo report good results from a combined treatment of sulfadiazine by mouth and penicillin and streptomycin intramuscularly in 28 cases of purulent meningitis. Most of the patients were infants and young children. At the beginning of treatment the daily doses per kilogram of body weight should be 50 mg. of sulfadiazine, 50,000 units of penicillin, and 50 mg. of streptomycin. Further doses should be adjusted to the clinical course of the disease, the changes of the cerebrospinal fluid, and the levels of the aforementioned drugs in the cerebrospinal fluid. In the cases reported there were no complications, sequelae, or deaths. The cerebrospinal fluid promptly returned to normal, and the disease was promptly controlled.

Beiträge zur klinischen Chirurgie, Munich

182:1-128 (No. 1) 1951. **Partial Index**

Rare Mixed Tumor of Kidneys. E. Ungeheuer.—p. 1.

Measuring Chronaxia in Protruded Intervertebral Disk. H. Griessmann. —p. 7.

Results of Treatment of Hypospadias: Experience with Meyer-Burgdorff's Plastic Surgical Method. J. Edelhoff.—p. 15.

*Differential Diagnosis: Gas in Tissues. G. Sättler.—p. 56.

*New Basic Concepts and Points of View Concerning Pathogenesis and Therapy of Urogenital Tuberculosis. A. Gütgemann.—p. 83.

Differential Diagnosis of Gas-Forming Infections.—The following classification of infections associated with gas in the tissues is suggested: infections associated with air introduced by foreign body, abscess containing gas, gas phlegmon, true gas gangrene of muscular tissue, and putrid gangrene associated with gas. Roentgenologic demonstration of gas in the tissues is of considerable aid to early diagnosis and differential diagnosis. Circular translucent areas of gas above a horizontal liquid surface, particularly in the neighborhood of a causative foreign body, are characteristic of an abscess containing gas. A coarse or fine mottled arrangement of air bubbles in the interstitial areas characterize the gas phlegmon, and feathering of the muscular fibers is to be considered as definite proof of gas gangrene. Putrid gangrene with secondary formation of gas is characterized by a more spongelike structure. There is not always a sharp transition between the roentgenologic picture of putrid gangrene and that of true gas gangrene, mainly because the two frequently occur together. The roentgenologic picture is also an aid in the exact localization of gas gangrene in cases in which proximal to the origin of the gas formation the blood supply of still healthy tissue has been stopped by the diffusion of gas under high pressure. In addition, roentgenography may be helpful in revealing gas gangrene in the deep tissues in the absence of clinical signs. Roentgenologic examination, therefore, should be performed in all doubtful cases.

Urogenital Tuberculosis.—According to Gütgemann, tuberculosis of the urinary system is to be considered frequently as an intermediate stage in the course of generalized tuberculosis. Insufficient consideration of the general condition of resistance, the phase of the disease, and the stage of the tuberculous changes of the tissues are the reasons why definite recovery frequently is not obtained with nephrectomy. Early nephrectomy is still indicated when the tuberculous kidney constitutes a predominant focus, with extensive destruction of its parenchyma and loss of function, thus becoming the starting point of a progressive tuberculosis of the urogenital system. Surgical intervention is not advisable when (1) postprimary tuberculosis is still developing, (2) there is late primary infection with a rapid course, (3) hematogenous dissemination has occurred only recently, (4) there is the possibility of the subsequent occurrence of destructive foci on the as yet uninvolved side, and (5) resistance is not yet consolidated or there is progressive tuberculosis of other organs. Preparatory medical treatment is required in all these cases as well as in those of recent exudative tuberculosis of the kidney. It is imperative to reduce the exudative parenchymatous tuberculosis to a productive-fibrous phase by conservative helio-aerotherapy and to use surgical treatment only after the general resistance has improved and the unilaterality and destructive form of the focus has been established. On the other hand, early nephrectomy is indicated in patients with

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An asterisk (*) before a title indicates that the article is abstracted. Single case reports and trials of new drugs are usually omitted.

symptoms on one side only, progressive destruction of parenchyma, toxic lesions of the other kidney, rapidly progressive course of tuberculosis of the bladder and the genital organs, mixed infections, intermittent obstruction and closed pyonephrosis, small focus on the other side, and severe bacilluria. Nephrectomy is less urgent in cases in which a purely parenchymatous nondestructive form of renal tuberculosis may be suggested by mild bacteriuria and albuminuria; in tuberculous nephritis, and in patients with small papillary foci, mild pyuria, good renal function, and no cystitis. Foci in the male genital organs deserve greatest consideration and simultaneous treatment, but radical intervention is indicated only for caseating, disintegrating and disseminating unilateral foci in the seminal vesicles and in the prostate.

British Journal of Dermatology, London

63:123-164 (April) 1951

Vitamin A in Some Congenital Anomalies of Skin. A. D. Porter.—p. 123.
Tylosis Palmaris et Plantaris: Report of Case with Some Unusual Features. I. Anderson.—p. 127.
Basic Concepts in Production and Management of Psychosomatic Dermatoses—II. F. E. Cormia.—p. 129.

British Journal of Ophthalmology, London

35:125-188 (March) 1951

Hyaline Infiltration of Eyelid. N. Ashton and A. Rey.—p. 125.
Brightness Perception and Binocular Adaptation. M. Pugh.—p. 134.
Retinal Changes in Coarctation of Aorta. K. O. Granström.—p. 143.
Phosphatase Activity in Ocular Tissues. J. L. Reis.—p. 149.
Aureomycin Borate in External Ocular Conditions. R. J. McWilliam and T. Wilson.—p. 153.
Vascularization of Cornea. J. H. Doggart.—p. 160.

British Journal of Urology, Edinburgh

23:1-96 (March) 1951. **Partial Index**

Aberrant Artery—Its Division or Conservation in Hydronephrosis. A. W. Adams.—p. 6.
Biopsy of Intra-Ureteral Tumours by Endoscopic Means. N. W. Roome, R. H. Flett and C. M. Spooner.—p. 23.
Case of Hermaphroditism. J. D. Fergusson.—p. 29.
Case of Ganglio-Sympatheticoblastoma of Testis in Infant. G. Smith. —p. 39.
Semen Analysis in Cases of Tuberculous Prostato-Vesiculitis and Its Importance for Indications of Prophylactic Vasectomy. O. Obrant. —p. 46.
Two Extreme Forms of Autonephrectomy in Renal Tuberculosis. J. Fischmann.—p. 52.
Fournier's Gangrene. D. Ebrill and M. O'Donoghue.—p. 56.
Stone Formation in Urethra: Report of Two Cases. G. W. V. Greig. —p. 60.

British Medical Journal, London

1:653-714 (March 31) 1951

*Penicillin-Resistant Subacute Bacterial Endocarditis Treated by Combination of Penicillin and Streptomycin. J. E. Cates, R. V. Christie and L. P. Garrod.—p. 653.
Clinical Trials of A. C. T. H. in Haemolytic Anaemia. L. S. P. Davidson, J. J. R. Duthie, R. H. Girdwood and R. J. G. Sinclair—p. 657.
Effect of A. C. T. H. and Suprarenal Extract on Bone Marrow. J. M. Yoffey, W. K. Metcalf, G. Herdan and V. Nairn.—p. 660.
*Sympathectomy for Hypertension. S. M. Chris.—p. 665.
Effects of A. C. T. H., Cortisone and D. C. A. with Ascorbic Acid on "Formalin-Arthritis." M. W. Parkes and F. Wrigley.—p. 670.
Acute Perforation of Gastro-Duodenal Ulcer Treated Conservatively. E. Scott.—p. 675.
Macrocytic Anaemia. G. Allen and C. F. Critchley.—p. 677.

Penicillin-Resistant Bacterial Endocarditis.—This is a report of four patients with subacute bacterial endocarditis due to penicillin-resistant organisms (Streptococcus faecalis in three and Str. viridans in one). Several types of therapy were tested in each patient. Separate courses of streptomycin and of aureomycin in two patients and of chloramphenicol in a third were all unsuccessful. A combination of penicillin and aureomycin failed to control the fever in one and produced toxic symptoms in another. In three the infection was apparently controlled by a combination of 20 million units of penicillin and 4 gm. of streptomycin daily for at least six weeks. One of these patients died later from heart failure; the other two are alive and well, except for vestibular damage. The fourth patient died from heart failure on the fifth day of treatment, and, although clinical response was prompt, necropsy indicated that infection had not been eliminated. Previously this patient had relapsed after smaller dosages of penicillin and streptomycin given together. The infecting organism was highly resistant to streptomycin. In vitro, the bactericidal action of penicillin on the two organisms so tested was accelerated by the addition of streptomycin and retarded by the addition of aureomycin. In one patient tooth extraction during the prophylactic use of 2 million units of penicillin daily for six days was followed by subacute bacterial endocarditis due to a penicillin-resistant organism.

Sympathectomy for Hypertension.—Since 1945, 35 patients with severe essential and malignant hypertension have been treated by thoracolumbar sympathectomy at Hammersmith Hospital. All these patients met the following criteria: (1) age under 55 years, (2) blood pressure over 200/100 mm. of mercury, with diastolic pressure capable of being reduced at least 20 mm. of mercury by bedrest or sedation, (3) symptoms referable to hypertension present, (4) renal function adequate, (5) cardiac function compensated, and (6) residual disability from any previous cerebral vascular accident absent. Transpleural sympathectomy was performed with resection of the splanchnic nerves and of the ganglionic chain from the sixth thoracic ganglion to the first lumbar ganglion inclusively. Follow-up studies two to 51 months (average 18 months) later revealed that only 25% of the patients had maintained a significant fall in blood pressure but that 66% of them had been relieved of incapacitating symptoms and had returned to work. The author concludes that sympathectomy improves the prognosis of malignant hypertension and is a valuable procedure for a limited but definite group of patients with hypertension.

1:715-772 (April 7) 1951

Taking of Census, 1801-1951. A. J. Taylor.—p. 715.
Medical Significance of Census. W. P. D. Logan.—p. 720.
Sleep Problems in the First Three Years. R. S. Illingworth.—p. 722.
Treatment of Hydrofluoric Acid Burns. R. H. Dale.—p. 728.
Two Types of Diabetes Mellitus, With and Without Available Plasma Insulin. J. Bornstein and R. D. Lawrence.—p. 732.
Sex Pattern and Size of Family. M. H. Thomas.—p. 733.
Blood Flow in Gout. A. J. Barnett.—p. 734.
*Poliomyelitis and Diphtheria Immunization in Belfast. W. J. McLeod. —p. 736.
Anti-Trachoma Campaign in Gozo. V. Tabone.—p. 738.

Poliomyelitis and Diphtheria Immunization.—During an epidemic of 98 cases of poliomyelitis in Belfast an attempt was made to correlate the site of paralysis with previous inoculations of diphtheria toxoid. All but 10 of the 98 children showed paralysis. In two children poliomyelitis developed within one month after immunization against diphtheria. One of them was injected with 0.5 cc. of alum-precipitated toxoid in the right hip, and paralysis of the right leg developed after eight days. The other patient received 0.5 cc. of purified diphtheria toxoid, alum-precipitated, in the left arm, and facial paralysis developed 23 days later. In three children poliomyelitis developed within one to three months after the immunization against diphtheria. These patients had had injections in the arm, but paralysis did not develop in the arms in which injection was made, two of the patients having facial paralysis and the third having paralysis of both legs. In the 28 children in whom paralysis developed more than three months after inoculation, the injection, with one exception, had been given in the arm. In this group paralysis affected the arms less than the legs. In a group of uninoculated children under 2 years of age, paralysis affected the arms almost as frequently as the legs. This is in contrast to the usual preponderance of leg paralyses and shows the spontaneous variations in the site of involvement. An association between site of inoculation and site of paralysis was not observed after 6,250 inoculations of purified diphtheria toxoid, alum-precipitated, in children aged less than 9 years affected by the poliomyelitis epidemic. This limited experience does not prove that the site of inoculation and the site of paralysis in poliomyelitis are unrelated, but the author's experience suggests that purified diphtheria toxoid, alum-precipitated, is a relatively inocuous antigen as far as induction of poliomyelitis in the inoculated limb is concerned.

Edinburgh Medical Journal

58:1-42 (Jan.) 1951

Certain Aspects of Portal Hypertension. J. Learmonth.—p. 1.
Colonic Pain and Colon Neurosis. C. Seward.—p. 17.
Thiacetazone in Pulmonary Tuberculosis. J. H. R. Ramsay.—p. 29.

Giornale di Clinica Medica, Parma

32:133-248 (Feb.) 1951. Partial Index

*Significance of Hyperaminoacidemia in Hypoproteinemia. G. Labo' and T. Franco.—p. 133.
*Lack of Potassium, "Determining Factor" of Cardiovascular Insufficiency in Diabetic Coma. A. M. Bertolini and L. Scapellato.—p. 173.

Aminoacidemia in Hypoproteinemia.—Labo' and Franco determined the amount of amino acids in the blood of 25 patients with grave hypoproteinemia complicating different diseases. The level was high in all cases. Often the figures were twice the normal values. The test was repeated when hypoproteinemia diminished or increased. The amino acid level varied inversely as the concentration of proteins in the blood. The deaminizing power of the liver was tested in 15 patients and in 10 controls by the intravenous injection of 100 cc. of a 5% casein enzymatic hydrolysate solution. This power of the liver was normal in eight of the hypoproteinemic patients and diminished in seven. In the latter it became normal when the proteins in the blood became normal. In six patients disturbances in the metabolism of iron and vitamin B_2 paralleled the course of hypoproteinemia. This suggests that (1) hyperaminoacidemia in hypoproteinemia is due to disorders of the cellular respiratory enzymes, either independent of, or secondary to hypoproteinemia and (2) that the changes in the velocity of deamination in the liver are due to enzymatic disorders and not to liver insufficiency.

Hypopotassemia in Diabetic Patients in Coma.—According to Bertolini and Scapellato, intractable shock, which often follows diabetic coma controlled by insulin, is due to lack of contractility of the myocardial fibrils from insufficiency of serum potassium. The authors emphasize the importance of serum potassium in regulating muscular contraction and point out the causal factors of hypopotassemia in the course of diabetic coma. As proof of the role of hypopotassemia in this condition they cite the typical myocardial lesions from hypopotassemia reported in the literature, the regression of electrocardiographic changes in diabetic coma following the administration of potassium, and the control of diabetic coma by the administration of potassium.

Journal of Bone and Joint Surgery, London

33B:1-146 (Feb.) 1951

Protrusions of Lumbar Intervertebral Discs: Clinical Review Based on 500 Cases Treated by Excision of Protrusion. J. E. A. O'Connell. —p. 8.
Causes of Unsatisfactory Results from Operative Treatment of Lumbar Disc Lesions. J. R. Armstrong.—p. 31.
Pseudarthrosis of Tibia in Childhood. B. McFarland.—p. 36.
Note on Pseudarthrosis of Tibia in Childhood: Discussion Arising from Preceding Paper, with Some General Observations on Healing of Fractures. A. N. Birkett.—p. 47.
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Manubrio-Sternal Joint in Ankylosing Spondylitis. D. L. Savill.—p. 56.
Monteggia Fracture with Posterior Dislocation of Radial Head. J. H. Penrose.—p. 65.
Some Experiences in Treatment of Osteomyelitis of Infants: Evaluation of Results of Treatment by Penicillin. C. N. Athanassiadis.—p. 74.
Osteochondromatosis of Hip Joint. R. Bloom and J. N. Pattinson. —p. 80.
Osteochondromatosis of Hip Joint: Report of Case. G. Hamada. —p. 85.
Intrathoracic Meningocele, Spinal Deformity, and Multiple Neurofibromatosis. A. W. Lipmann Kessel.—p. 87.
Causative Mechanism in Morton's Metatarsalgia. J. D. Mulder.—p. 94.
De Quervain's Disease. B. Keon-Cohen.—p. 96.
Diaphysial Aclasis: Report of Unusual Case. V. H. Ellis and J. G. Taylor.—p. 100.
Cavernous Haemangioma of Knee Joint: Report of Case. A. H. Hunt and I. P. Todd.—p. 106.
Atlanto-Axial Fracture-Dislocation: Report of Case. G. O. Tippett. —p. 108.
First Recurrence of Osteomyelitis 80 Years After Infection. W. E. Gallie.—p. 110.
Disruption of Pelvis: Report of Case. T. F. Rose.—p. 112.

Journal of Hygiene, London

48:397-528 (Dec.) 1950

Rapid Detection of Mycobacterium Tuberculosis by Microscopic Examination of Milk from Individual Cows and from Groups of 10 Cows. M. L. C. Maitland.—p. 397.
Statistical Control in Haematology. H. O. Lancaster.—p. 402.
Alkali-Dissolved Diphtheria Toxoid-Antitoxin Floccules Adsorbed on Aluminum Carriers: Preparation, and Immunity Experiments in Animals. J. H. Mason.—p. 418.
Repeated Re-Use of Sea Water as Medium for Functioning and Self-Cleaning of Molluscan Shellfish. L. A. Allen, G. Thomas, M. C. C. Thomas and others.—p. 431.
Experimental Study of Haemolytic Disease of Newborn Due to Isoimmunization of Pregnancy: II. Report of Attempt to Produce Anti-Red Cell Isoantibodies in Guinea Pigs, Together with Note on Blood Picture of One-Day Old Guinea Pigs. L. S. Mynors, D. H. Heard and R. R. A. Coombs.—p. 458.
Human Tuberculosis of Bovine Origin in Northern Ireland. L. V. Reilly. —p. 464.
Infantile Gastro-Enteritis with Special Reference to Specific Serological Type 0 55 B5 H6 (Beta Type) of Bacterium Coli. J. Smith, W. H. Galloway and A. L. Speirs.—p. 472.
Conglutination Phenomenon: VII. Study of Interaction of Complement Components and Conglutinin in Process of Conglutination. R. R. A. Coombs, A. M. Blomfield and G. F. Roberts.—p. 484.
Brucella Bacteriophage. M. J. Pickett and E. L. Nelson.—p. 500.
Detection of Streptococci in Air. R. E. O. Williams and A. Hirch. —p. 504.

Journal de Médecine de Lyon

32:303-350 (April 5) 1951. Partial Index

Respiratory Paralysis in Acute Infections of the Nervous System. P. Sédallian, A. Bertoye, R. Maral and others.—p. 305.
Gastric Dilatation Due to Vagal Paralysis in Poliomyelitis. P. Sédallian, R. Maral, C. Exbrayat and others.—p. 321.
*Development of Paralysis in Two Stages in Heine-Medin Disease. P. Sédallian and L. Gaillard.—p. 331.
*Should Routine BCG Vaccination be Practiced in Newborn Infants? H. Pigeaud, G. Despierres and A. Sabot.—p. 335.

Paralysis in Two Stages in Poliomyelitis.—In about 5% of the cases of poliomyelitis, paralysis may develop in "two stages," i. e., new peripheral paralyses may develop within eight days to one month after the first appearance of paralysis and may be localized in parts of the body not previously involved. The authors recently observed five cases of this type. One was that of an adolescent, 17, with flaccid quadriplegia and definite meningeal syndrome. Within one month, when the acute phenomena had disappeared and the patient was able to move his lower extremities somewhat, he experienced an attack of bulborespiratory type with tracheobronchoplegia and paralysis of the intercostal muscles and of half of the diaphragm. These symptoms subsided partially, and the patient survived. A second patient, 15, with flaccid quadriplegia and total respiratory paralysis, had been placed in a mechanical respirator for two months, when suddenly he presented a paralysis of the hypoglossal nerve followed by fatal coma. The authors' five patients were treated with convalescent serum and large doses of pteroylglutamic acid (folic acid); they were also given roentgen irradiation of the spinal cord, and two of them received large doses of cortin. None of this therapy prevented the "second stage" of paralysis. In most of the patients of this type reported on in the literature, the upper levels of the spinal cord were involved. Seventy-six per cent of the patients had severe quadriplegia or respiratory paralysis or both. Intercurrent infections, such as chickenpox and infectious pulmonary complications, in patients with respiratory paralyses seem to predispose to this particular type of paralysis. The pathogenesis remains doubtful. Although the possibility of a relapse or a second attack may be considered, one must admit that the virus is capable of persisting in the nervous system of certain patients with poliomyelitis or of reinfecting the organism by the endogenous route. Weakened resistance due to intercurrent infection and prolonged presence of the virus in the fecal matter may play some part.

Routine BCG Vaccination of the Newborn.—In the course of the first six months of 1950, BCG vaccination was given to 650 infants in a maternity ward. Only premature infants whose weight was less than 5 lb. (2,267.96 gm.) and those whose mothers refused vaccination were not vaccinated. Within six weeks after the vaccination 361 of the 650 infants were subjected to a skin test, and the reaction to it was positive in 97.78%. Six months later a control test could be performed on only 154 children. The cutaneous reactions were positive in all the children, including two who had negative reactions to the first test. Thus the purpose of the vaccination, to induce the appearance of a cutaneous allergy, was fully achieved. Significant reactions in the lymph nodes in the vaccination area occurred in only eight children. "Becegitis" is the term that was coined for this accident. Recovery without fistulization occurred in four instances, and fistulization occurred in three, in one of which Koch's bacillus was demonstrated. A large left carotid lymph node was observed in the eighth child. An incision was made, and pus was removed that resembled the pus of a cold abscess. The lymph nodes in the right subclavicular region and those in the right masseter muscle were also enlarged. There was a highly positive reaction to a repeated skin test. The child took a downhill course and died. Koch's bacillus could not be demonstrated. Accidents of this type were never observed in adults. Since a regular follow-up of the vaccinated children during the first years of life is not possible practically although it is imperative, the authors doubt the expediency of routine BCG vaccination in newborn infants in a maternity ward, not so much because of the risks involved, which are minimal, but because of the danger of discrediting an excellent method of prophylaxis, the systematic employment of which should be limited to adolescents and adults who still have negative reactions to tuberculin skin tests, and to children in the school age.

32:351-396 (April 20) 1951. **Partial Index**

- •Bacteriologic Dependence on Streptomycin and Clinical Exacerbations Due to Streptomycin. A. Dufourt, J. Brun, J. Viallier and J. C. Kalb. —p. 351.
- Cardiovascular Disturbances from Acute Carbon Monoxide Poisoning: Report of Case of Syphilitic Aortitis with Sudden Decompensation of This Origin. R. Froment, H. Fraisse and P. Fourier.—p. 357.
- •Thirty-Five Cases of Brucellosis Treated with Aureomycin. M. Y. Mazaré and O. Bertheas.—p. 375.

Bacteriologic Dependence on Streptomycin.—Five patients between 25 and 45 with tertiary pulmonary tuberculous lesions are reported on. In four of these patients two distinct successive clinical phases were observed during treatment with streptomycin. In the first phase, which varied in duration, the condition of the patients improved with administration of streptomycin. During the second phase the condition of the patients became worse when the drug was given, and their tuberculous lesions progressed rapidly. In this stage the tubercle bacilli showed in vitro a relative dependence on streptomycin: instead of being inhibited by the antibiotic, they grew more abundantly and more rapidly when streptomycin was added to the Youmans medium. In one patient the first course of treatment produced an exacerbation of his condition, and an absolute dependence of Koch's bacillus on streptomycin was demonstrated in vitro: the bacillus could be isolated in Youmans medium only when streptomycin was added. In this patient the two clinical phases that were observed in the four other patients could not be differentiated, because of the rapid development of the bacterial dependence in the ulcerative-caseating lesions within three weeks. Resistance to streptomycin when once acquired is permanent, but dependence is temporary, and the strains may lose their dependence more or less rapidly, provided that contact with the antibiotic is discontinued. For long periods of time bacterial resistance may not be associated with dependence, despite continued treatment with streptomycin. Bacterial resistance to streptomycin observed in vitro is to be considered a danger signal, which requires immediate discontinuation of treatment. Sputum cultures should also be made then, since resistance to streptomycin may quickly be followed by dependence. Paraaminosalicylic acid given by mouth and continued administration of streptomycin in effective doses frequently but not always prevents resistance. The authors advise against alternative courses of treatment with paraaminosalicylic acid and streptomycin and against isolated or repeated courses of treatment with 20 to 40 gm. of streptomycin alone, which they consider as a definite means of building resistance of the bacilli to the antibiotic. Intramuscular administration of a total dose of 80 to 120 gm. of streptomycin combined with oral administration of paraaminosalicylic acid given by mouth in daily doses of 15 to 25 gm. is recommended.

Aureomycin in Brucellosis.—Thirty-five patients, 22 men, 11 women, and 2 children, with brucellosis were treated with aureomycin on a daily dose of 0.10 to 0.25 gm., which was increased gradually to a maximum of 2 to 3 gm. in adults and maintained for two weeks. The total dose varied from 24 to 55 gm. Clinical recovery was rapid and spectacular in 33 patients. Headache subsided within four to five days, the spleen became smaller within 10 days, and myalgia and arthralgia disappeared within 15 days. The patients were apparently cured within 15 to 20 days. Two patients were therapeutic failures. Untoward reactions to the drug consisted of nausea, vomiting, pruritus ani, and malaise but were never so severe that discontinuation of treatment was required. Late results of treatment were less satisfactory than early results. Of 22 patients, nine who had been followed up for one to eight months made a complete and definite recovery. In two patients symptoms reappeared in an attenuated form after the patients' discharge from the hospital and persisted for three weeks, to be followed by recovery, which then was maintained for four and seven months respectively. Eleven patients had true recurrences, with refractory symptoms requiring repeated hospitalization in three instances. The authors believe that aureomycin induces improvement rather than a definite cure of brucellosis. Prognosis is more favorable in young patients, provided that large doses (4 gm. daily from the start of the treatment) may be administered for 30 days (total dose 120 gm.) and that treatment is instituted early. The systematic combination of aureomycin therapy with vaccine therapy seems to be justified.

Journal of Mental Science, London

97:259-440 (April) 1951. **Partial Index**

- Priscol in Circulatory Deficiency. L. D. Gardner.—p. 278.
- Childhood Schizophrenia and Mental Deficiency. B. W. Richards.—p. 290.
- Mental Diseases Peculiar to Certain Cultures: Survey of Comparative Psychiatry. P.-M. Yap.—p. 313.
- Loss of Written Language Due to Dissolution of Phonetic Structure of Word in Brain Abscess. R. Klein.—p. 328.
- Permeability of Blood-Brain Barrier to Penicillin in Cases of Parenchymatous Neurosyphilis. R. H. F. Smith.—p. 340.
- Fifty Cases of Epilepsy Treated with "Tridione." J. Hoenig.—p. 362.
- Desoxycortone Acetate and Ascorbic Acid in Treatment of Schizophrenia. L. Rees and G. M. King.—p. 376.
- •Account of E. C. T. Given to Patient with Tantalum Plate in His Skull. H. Osmond.—p. 381.

Electric Convulsion Therapy with Tantalum Plate in Skull.—This is the first report of electric shock therapy in a patient with a metal plate in his skull. The patient was a man, 30, with a depressive state following severe head injury. Skull x-ray plates showed a large metal plate in the left frontoparietal region and a retained metallic fragment in the vault near the right border of the plate. There was some doubt as to what might happen if electroshock therapy were given to a patient with a tantalum plate in his head, but the patient agreed to the treatment and 7 electric convulsion treatments were given without untoward effect. Complete recovery ensued. The author believes that there will not be many cases like this one; but with the increase of extensive brain surgery it is possible that from time to time other patients will be seen for whom electric convulsion therapy might be withheld because of doubts about its safety, when, if given, it would perhaps produce speedy relief.

Journal Neurol., Neurosurg. & Psychiatry, London

14:1-58 (Feb.) 1951

- Projection of Olfactory Epithelium on Olfactory Bulb in Rabbit. W. E. Le Gros Clark.—p. 1.
- Observations on Passage of Weed's Prussian Blue Mixture Along Axis Cylinders and Inter-Fibre Fluid of Nerves. E. J. Field.—p. 11.
- Method of Measuring Reflex Times Applied in Sciatica and Other Conditions Due to Nerve-Root Compression. D. S. Malcolm.—p. 15.
- Arteriography and Carotid Artery Ligation in Intracranial Aneurysm and Vascular Malformation. I. S. Wechsler, S. W. Gross and I. Cohen. —p. 25.
- Disability Caused by Brain Wounds: Review of 1,166 Cases. W. R. Russell.—p. 35.
- Visual Field Defects in Subacute Combined Degeneration of Spinal Cord. G. H. H. Benham.—p. 40.
- Investigation into Effects of Glutamic Acid on Human Intelligence. J. R. Milliken and J. L. Standen.—p. 47.

Lancet, London

1:647-698 (March 24) 1951

- *Risks of Gastroscopy: Survey of 49,000 Examinations. F. A. Jones, R. Doll, C. Fletcher and H. W. Rodgers.—p. 647.
- Accidental Perforation During Gastroscopy. T. H. Boon.—p. 651.
- General Anaesthesia for Gastroscopy. J. C. Goligher and H. L. Thornton.—p. 652.
- Use of High-Frequency Ultrasonic Waves for Detecting Changes of Texture in Living Tissues. J. J. Wild and D. Neal.—p. 655.
- Aplastic Anaemia: Review of 27 Cases. E. B. Adams.—p. 657.
- Effect of A. C. T. H. in Acute Dermatomyositis. M. M. Suzman and J. A. Rudolph.—p. 660.
- Controlled Hypotension and Postural Ischaemia to Reduce Bleeding in Surgery: Review of 250 Cases. G. E. H. Enderby and J. F. Pelmore.—p. 663.
- Use of Pentamethonium and Posture to Reduce Bleeding in Fenestration Operations. G. Hughes.—p. 666.
- *Influence of Androgens on Sexuality in Women. G. L. Foss.—p. 667.

1:699-752 (March 31) 1951

- Evaluation of Public-Health Measures for Control of Syphilis: Epidemiologic Study. J. E. Moore.—p. 699.
- Intramedullary Nailing in Recent Fractures of Femoral Shaft. G. C. Lloyd-Roberts.—p. 711.
- Diphtheria Antitoxin in Cord-Blood: Survey of Samples from 15 Areas of British Isles. M. Barr, A. T. Glenny and H. J. Parish.—p. 713.
- Post-Traumatic Epidermoid Cysts. F. Young.—p. 716.
- Estimation of Alkali Reserve: Method for Routine Hospital Use with Small Amounts of Plasma. H. Lehmann.—p. 718.
- Human Infection with Virus of Contagious Pustular Dermatitis. G. M. Lloyd, A. Macdonald and R. E. Glover.—p. 720.
- Experimental Nystagmus. R. C. Browne.—p. 721.

Risks of Gastroscopy.—The risks associated with gastroscopy were assessed by means of a questionnaire sent to 40 gastroscopists. Seventy-five accidents with 32 deaths were reported following 49,000 gastroscopies. Five additional accidents with three deaths were reported, but the corresponding number of gastroscopies was not known. Fifty-four, i. e., two-thirds of the accidents were perforations of the esophagus, which usually occurred in the upper esophagus or hypopharynx with the use of the Hermon Taylor gastroscope. Most of them occurred in women over 50, and the risk in this age and sex group was estimated to be nine or 10 times that in men over 50 and in younger women, and 30 times that in younger men. It is recommended that the Wolf-Schindler gastroscope be used routinely for gastroscopy in elderly women and in all outpatients. An appreciable number of accidents occurred with both the blunt metal and the rubber fingertips; it could not be determined which was safer. Since the introduction of penicillin a significant proportion of patients with esophageal perforations have recovered on medical treatment. Conservative treatment should be tried in mild cases, but when a gross leak is apparent or there is perforation of the lower esophagus immediate suture should be performed. Perforation of the stomach has been rare following the abandonment of the rubber sponge tip; when it occurs it may be treated medically. Six reactions to the anesthetic were reported, five of which were fatal. Of the deaths, four were atributable to overdosage. Four cubic centimeters of 2% tetracaine (pontocaine®) hydrochloride should be the maximum used as a local surface anesthetic. Owing to the definite risk attached to gastroscopy the indication for each examination should be clearly defined.

Influence of Androgens on Sexuality in Women.—Ten women between 37 and 63 with advanced metastases from cancer of the breast were treated with massive doses of testosterone propionate in oil. The doses varied between 200 and 300 mg. daily for several weeks until improvement occurred or the patient was obviously not benefited and was deteriorating rapidly. In those in whom clinical improvement was observed, the doses were gradually reduced in amount and frequency. An abnormal increase in sexual desire was recorded in those patients who had shown temporary clinical improvement. These observations confirm those of other workers on the effect of androgens on sexual behavior in female patients and are in accord with the experiments of Klein on animals. It is suggested that sexual behavior in women may normally depend more on suprarenal androgens than on estrogens.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

95:593-656 (Feb. 24) 1951. Partial Index

- *Influence of Injections of Testosterone on Primary Chronic Polyarthritis. K. W. Kuipers.—p. 611.
- Combined Surgical and Injection Therapy in Varicose Saphenous Vein: Experiences in 556 Cases. J. S. van Coevorden.—p. 619.

Injections of Testosterone in Polyarthritis.—Kuipers points out that the earlier trials with hormone therapy in arthritis may be regarded as forms of steroid therapy. He mentions among others his report with Touw in 1938 on the use of progestin in primary chronic polyarthritis. He briefly discusses the use of pituitary adrenocorticotropic hormone and of desoxycorticosterone acetate together with vitamin C. This report concerns chiefly the results obtained with testosterone propionate. All the 20 patients treated with this hormone were men who had typical chronic polyarthritis with changes in the joints, muscular atrophies, "glossy skin," subfebrile temperatures, poor general condition, and increased erythrocyte sedimentation rate. The average duration of symptoms was three years and the patients had been subjected to other therapeutic measures before this treatment was begun. Testosterone propionate in oil was injected into the gluteal muscle in doses of 75 or 100 mg. twice each week. Patients showing no effects after six to eight injections were sometimes given doses of 200 to 250 mg., but after two such doses the usual 100 mg. doses were resumed. Doses were reduced to one a week in those showing improvement. This treatment proved effective in 10 of the 20 patients. The author feels that further trials with this treatment are justified.

95:657-760 (March 3) 1951. Partial Index

- *Hemorrhagic Diathesis as Symptom of Carcinoma. J. Zeldenrust.—p. 679.
- Tuberculous Pleurisy and Pulmonary Tuberculosis. B. van Vliet.—p. 684.
- *Peptic Ulcers in Aged Persons. J. ten Kate.—p. 689.

Hemorrhagic Diathesis as Symptom of Carcinoma.—In two women, 51 and 49, respectively, signs of hemorrhagic diathesis appeared, with thrombopenia as the most significant hematological change. Both patients died, one about six weeks and the other about two months after the first appearance of the cutaneous hemorrhages. Necropsies disclosed carcinoma of the ovary in one and of the stomach in the other woman. In both cases the carcinoma had metastasized into the bone marrow. There had been no other signs of carcinoma, before the hemorrhagic diathesis appeared.

Peptic Ulcers in Aged Persons.—On the basis of case histories of seven patients, who ranged in age between 73 and 79, the clinical aspect of peptic ulcer in aged persons are discussed. These patients did not have a long history of ulcer symptoms, the duration in the reported cases ranging from a few days to four months. In four of these patients hemorrhages occurred, and in one perforation resulted. Vascular sclerosis is probably an important factor in this type of peptic ulcer. The short duration of symptoms and the roentgenologic aspects often suggest carcinoma. When carcinoma is suspected or when hemorrhages occur, surgical treatment is advisable. Five of the seven patients here discussed were subjected to resection; in one a gastroenterostomy was done, and in one the perforation was closed. All recovered.

Nordisk Medicin, Stockholm

45:301-342 (Feb. 28) 1951

- Ulcer of Leg—Problem in Medicine? O. Gilje.—p. 301.
- *PAS and Streptomycin in Surgical Treatment of Pulmonary Tuberculosis. G. Birath, T. Bruce, C. Crafoord and L. G. Uggla.—p. 306.
- Resection of Lung in Tuberculosis. P. Vaksvik.—p. 310.
- Tests of Disinfection of Tubercle Bacilli. E. Bengtsson.—p. 312.
- Renal Venous Thrombosis. R. Wichmann.—p. 316.
- Barium Intoxication. S. Aarseth.—p. 318.

PAS and Streptomycin in Surgical Treatment of Pulmonary Tuberculosis.—Birath and his associates state that their comparative analysis in 1948 of the value of paraaminosalicylic acid and streptomycin respectively in connection with surgical treatment of pulmonary tuberculosis testifies to the importance of more consistent chemotherapy. Chemotherapy permits surgical treatment in patients not previously operable. In 1949 preoperative treatment with paraaminosalicylic acid was given to 73 patients, streptomycin to 12 patients, and combined paraaminosalicylic acid and streptomycin to 25. Many advanced cases were included. Surgical treatment was performed as planned in 107 cases, and after four months there are residual cavities in eight patients and spread in three. During operative and postoperative treatment the number of patients who received combined paraaminosalicylic acid and streptomycin was increased to 50. Systematic preoperative treatment starting, as a rule, with paraaminosalicylic acid is recommended. Streptomycin should be reserved for use when the effect of paraaminosalicylic acid is not fully satisfactory or for complications following operation, when it should be given in combination with paraaminosalicylic acid.

Nordisk Medicin, Stockholm

45:343-382 (March 7) 1951

Tapeworm Problem in Finland. O. Vartiainen.—p. 343.
*Symptoms of Toxoplasmosis. J. H. Magnusson.—p. 344.
*Pathologic Anatomy of Toxoplasmosis. F. Wahlgren.—p. 349.
*Laboratory Diagnosis and Epidemiology of Toxoplasmosis. S. Gard. —p. 352.
Restraint in Chemotherapy of Tuberculosis. A. Westergren.—p. 357.
Terramycin. N. Diding and R. Lundström.—p. 359.
Xanthomatous Biliary Cirrhosis. J. Myren.—p. 360.
Malignant Insulinoma with Liver Metastases Producing Insulin. M. Iversen.—p. 362.
Pulmonary Chondroma. B. Istre.—p. 363.

Symptoms of Toxoplasmosis.—Recent investigations show infection with Toxoplasma to be much commoner than was formerly supposed. When toxoplasmosis occurs in pregnancy, the infection may be transmitted to the fetus. The earlier in pregnancy the infection occurs, the greater seems to be the danger of fetal death and abortion; if the infection occurs during the later part of pregnancy the infant is born prematurely or at term, but with more or less grave symptoms. The most important symptoms in congenital toxoplasmosis are hydrocephalus, cerebral calcification, chorioretinitis, convulsions, and retarded mental development. Toxoplasma changes can be demonstrated in almost all organs. In typical congenital toxoplasmosis all the cardinal symptoms may be present or one or more may be lacking. Even in typical cases, however, decisive diagnosis must depend on the results of laboratory examinations. There is a form of congenital encephaloretinitis that suggests congenital toxoplasmosis but has a different and unknown etiology. The prognosis varies greatly. Postnatally acquired toxoplasmosis is due to infection in childhood or later and has no effects comparable to the extensive destruction in the central nervous system and eyes found in congenital toxoplasmosis. The author reports eight serologically established cases of postnatal toxoplasmosis, one case in a girl, 9, with peripheral lymphadenitis and signs of encephalitis and seven cases in adults, two infected in a Toxoplasma laboratory and five with spontaneous infections. The onset was acute, with fever, in five cases. The peripheral lymph nodes were involved in six cases. In two cases there was a purely glandular form of clinically manifest toxoplasmosis; this form seems to represent a transition to the subclinical form of the disease. Two patients with symptoms resembling those described by Pinkerton and Henderson were severely ill and had not fully recovered six months after the onset. In one instance with unilateral choroiditis as the only clinically demonstrable symptom the dye test (Sabin-Feldman) titer was 1:2,000 and there was complement fixation in a dilution of 1: 120. Treatment of three cases with aureomycin and one with sulfamerazine ("sulfadimine") had no certain effect.

Pathological Anatomy of Toxoplasmosis.—Necropsy in six serologically verified cases of congenital toxoplasmosis revealed an inflammatory process in the organs of the body, but without exception the most pronounced tissue changes were in the central nervous system. It was concluded that the infection spreads by hematogenous way and that the tissue of the central nervous system is especially susceptible. The grave character and wide extent of the changes in stillborn infants or infants who died at birth point to fetal transmission of the infection. In all cases the mother's blood gave positive serum reactions with high titer values. Biopsy specimens from the lymph nodes in four cases of acquired toxoplasmosis with acute fever and pronounced serologic reactions to Toxoplasma showed rather pronounced inflammation, characterized by swelling of the reticular cells and agglomeration of eosinophilic leukocytes and plasma cells in the tissue. In patients with fever from undetermined cause this pattern might suggest toxoplasmosis.

Laboratory Diagnosis and Epidemiology of Toxoplasmosis.—Congenital toxoplasmosis is commoner than previously supposed. Congenital toxoplasmosis seems always to have clinical manifestations; acquired toxoplasmosis usually seems to be asymptomatic. In congenital toxoplasmosis demonstration of the parasites in the tissue is comparatively easy; they can be demonstrated in great numbers in the cerebrospinal fluid. As blocking of the aqueduct by necrotic masses may prevent escape of the parasites into the lumbar fluid, ventricular puncture is advised. The parasites are identified by inoculation in mice and immunologic analysis of the strain isolated. Serologic tests should be performed in all cases of toxoplasmosis. The method of choice is the dye test according to Sabin and Feldman, in combination with complement fixation. In congenital toxoplasmosis the appearance of complement-fixing antibodies seems to be delayed, while in acquired toxoplasmosis the two reactions run a parallel course. In acute cases the dye test titer usually rises to values of 1: 1,000 or more; decrease is as a rule seen after three to six months. Persistence of high titers indicates the presence of an active focus. For diagnostic purposes repeated examinations are recommended. The toxoplasmin skin test might be useful in epidemiologic surveys. Performance of this test in Stockholm showed a high percentage of positive reactions. The incidence increased from the age of 5 to the age of 20, after which it remained about constant. Preliminary investigations of similar kind in northern Sweden showed a far lower percentage of positive results in adults. The uneven distribution of latent toxoplasmosis indicates an extrahuman reservoir of infection. Evidence points to insect transmission as a mode of spread.

Philippine Medical Association Journal, Manila

27:1-84 (Jan.) 1951

Current Concepts on Carbohydrate Metabolism. N. Cordero.—p. 1.
Bacteriological and Serological Findings in Salmonella Paratyphi Infection. A. P. Roda, Z. Aviado-Tanquintic and M. Jimenez.—p. 7.
Proposed Modification of Segregation of Leprosy Cases in the Philippines. J. G. Tolentino.—p. 21.

Practitioner, London

166:209-310 (March) 1951. **Partial Index**

Modern Concepts of Venous Thrombosis. A. J. Quick.—p. 213.
Treatment of Varicose Veins. R. S. Handley.—p. 228.
Some Reflections on Operative Results Obtained on 600 Varicose Limbs. R. R. Foote.—p. 244.
Some Clinical Aspects of Thrombophlebitis. A. Hunter.—p. 251.
Prevention and Treatment of Thrombophlebitis. C. J. Gavey.—p. 260.
Diagnosis and Treatment of Neuroses in Out-patient Practice. R. Thompson.—p. 269.

Presse Médicale, Paris

59:385-416 (March 28) 1951. **Partial Index**

*Koch's Bacillus in Intermittent Contact With Streptomycin. É. Bernard and B. Kreis.—p. 385.
Osteosarcoma of Mandible: Difficulty of Roentgenologic and Histological Diagnosis. M. Dechaume and F. Baclesse.—p. 387.
Experimental Meningoencephalitis Produced in Rabbits by Intracerebral Injection of Leukemic Products After Filtration: Presence of Intracellular Corpuscles in the Brain. M. Petzetakis.—p. 388.

Koch's Bacillus and Streptomycin.—In vitro experiments were performed with cultures of Mycobacterium tuberculosis obtained on microscopic slides. The technique made it possible to keep the cultures for a certain time in a medium to which dihydrostreptomycin had been added, then to wash them, to place them in a new test tube with a medium to which dihydrostreptomycin had not been added, and to repeat this procedure at any desired rate. Thus the effect of intermittent contact of M. tuberculosis with dihydrostreptomycin could be studied. Results showed that dihydrostreptomycin continued to inhibit the reproduction of the bacilli after the two were no longer in contact and that the period of inhibition increased with the concentration of the dihydrostreptomycin. At therapeutic concentrations and with bacilli of normal sensitivity, inhibition of bacterial growth was obtained in Youman's medium with a single eight hour contact every second or even every third day. Tubercle bacilli were immersed for several hours in a solution of dihydrostreptomycin of known titer. The bacilli then were removed by centrifugation, and the dihydrostreptomycin solution was again titrated. The significantly reduced titer proved that the antibiotic had been absorbed by the bacilli. This fixation of the antibiotic by the bacilli may explain the persistence of the inhibitory effect of the antibiotic, even if the medium may have become favorable to reproduction. It is essential to remember that the strains of bacilli used were highly sensitive to the drug, that the results varied with the culture medium employed, that the inhibition of the development of the bacilli is only one of the elements of the cure of a tuberculous focus, and that the destruction of the bacilli must be carried out by the organism as a function of the action of the leukocytes, which varies according to local anatomic conditions. The in vitro test must thus be interpreted with caution, but the authors believe that the results obtained may be of therapeutic significance at least in certain human cases.

Revista Española de Pediatría, Zaragoza

7:1-116 (Jan.-Feb.) 1951. **Partial Index**

- *Tuberculous Abscesses and Empyema Following Penicillin Therapy. G. Arce and J. Villota.—p. 1.
- *Psychic Incontinence of Feces (Encopresis). R. M. Calzada.—p. 15.
- *Pseudo-Orchitis in Children. F. J. Fernández.—p. 45.

Tuberculous Abscesses and Empyema Following Penicillin Therapy.—Arce and Villota report 13 cases of tuberculous abscess following intramuscular injections of penicillin and four cases of tuberculous empyema following intrapleural administration of penicillin in therapy of pneumococcic purulent pleurisy. The tuberculin test gave negative results before the development of the tuberculous disease and became positive after it in almost all cases. The clinical course of the disease was typical of primary infection in all patients. Many were infants who had not been exposed to infection, and some had been under constant medical care. The fact that these cases appeared in different clinics and in far distanct locales is evidence that such abscesses were not due to accidental contamination through technical defects at the time of the injection. The authors conclude that the etiological role of penicillin in the production of tuberculous abscesses and tuberculous empyema cannot be doubted in the cases they report. They emphasize the necessity for bacteriologic examination and guinea pig inoculation of the pus of all apparently sterile abscesses that appear in the course of penicillin treatment and of the pus from patients with purulent pleurisy that seem to be aggravated by penicillin therapy.

Psychic Incontinence of Feces (Encopresis).—Six children with psychic incontinence of the feces (encopresis) are reported on. The disease is evident in preschool and school-age children. It is most frequent among neuropaths who come from homes in which the moral, economic, and educative conditions are not favorable. Pathogenically, two mechanisms for the production of encopresis are accepted: (1) an increase in the rapidity and intensity of the defecation reflex, making voluntary control difficult, and (2) a decrease or lack of cerebral inhibition. A third factor is also evident in some cases, namely, hypotonia of the anal sphincter. The author concludes that the prognosis in encopresis is favorable. In the aforementioned cases, the treatment, which consisted of psychotherapy, produced good results in all cases.

Psuedo-Orchitis in Children.—Fernández discusses pseudo-orchitis in children and describes eight cases. The main causal factors of the syndrome are (1) torsion of the spermatic cord, (2) torsion of the sessile hydatid of Morgagni, and (3) the idiopathic hemorrhagic infarct of the testicle. Although the symptoms correspond distinctively to the variety of the anatomic component involved, the differentiation of some forms from others is difficult. The author establishes two phases in the differential diagnosis. In the first phase pseudo-orchitis is differentiated from acute infections, allergic, chronic, tuberculous, and syphilitic orchitis, whereas in the second phase the disease is differentiated from (1) pyogenic nonspecific, tuberculous, acute syphilitic, and chronic epididymitis and (2) epididymis and testicular tumors, local inflammation, and other local diseases. The treatment consists of early surgical detorsion of the testicle and orchiopexy of the testicle to the vaginal tunica of the testicle.

Revista Médica de Chile, Santiago

79:1-64 (Jan.) 1951. **Partial Index**

- *Single-Course Treatment of Syphilis. L. Prunes, M. Weinstein and H. Hevia.—p. 1.

Penicillin Implantation in Syphilis.—Results of subcutaneous implantation of procaine penicillin in 63 patients with syphilis are reported. Sixty adult patients each received 2,000,000 units of procaine penicillin (in a simultaneous implantation of two troches of 1,000,000 units apiece). The three remaining patients (children) had a single implantation of 1,000,000 units. In all cases spirochetes disappeared from the lesions within the first 24 hours and the syphilitic lesions healed or disappeared within one or two weeks after penicillin implantation. Ten of the 11 patients with seronegative primary syphilis maintained negative serum reactions during the entire observation period, seven of them for more than seven months. One showed a transitory positive serologic reaction that subsided within one month. All of nine patients with seropositive primary syphilis were controlled during an observation period of more than six months. Fifteen of 17 patients with secondary syphilis maintained negative serum reactions for more than four months. The fourth group of syphilitics who underwent procaine penicillin therapy included two adults with latent syphilis and five children with prenatal syphilis. Control of the disease was effected in all these cases following therapy without recurrences up to the present (more than nine months). The results of this study, on the basis of the 40 patients observed for more than four months, are satisfactory in all the cases of primary syphilis, in 82.7% of the secondary syphilis, and in 80% of the prenatal syphilis cases. Thus, 92.5% of all these patients responded favorably to procaine penicillin implantation therapy.

Schweizerische medicinische Wochenschrift, Basel

81:393-412 (April 28) 1951

- Continuous Peridural Anesthesia in Obstetrics: Experience in 105 Cases. A. Iklé and G. Reichen.—p. 393.
- *Therapy and Prognosis of Endocarditis Lenta. A. Staehelin.—p. 397.
- Clinicoexperimental Study on Terramycin Therapy. A. Bernstein and H. Reber.—p. 402.
- Epidemiology of Tuberculosis. H. Birkhäuser.—p. 407.

Subacute Bacterial Endocarditis.—Ten patients between 14 and 54 with subacute bacterial endocarditis were treated with massive doses of penicillin alone or combined with streptomycin for prolonged periods. Injections of water soluble crystalline penicillin were given every three hours. The daily dose varied from 320,000 to 2,000,000 units according to the clinical course. Treatment lasted seven weeks to five and a half months. Two patients received only 320,000 units of penicillin daily but had no recurrence for 20 and 22 months respectively after treatment was discontinued. To shorten the course of the disease, treatment was started with a daily dose of 1,000,000 units in the three patients who have been recently treated. One of the 10 patients, in whom there was complete resistance to penicillin, died from cerebral embolism after seven weeks of treatment. The remaining nine patients recovered. Seven were followed for 10 to 22 months after discontinuation of the antibiotics. There were no recurrences. One patient had temporary cardiac decompensation, and another had a cerebral embolism with hemiplegia within four and a half months after *treatment was terminated* but made a nearly complete recovery. Combined treatment with penicillin and streptomycin (0.6 gm. to 1.2 gm. daily) was given to five patients. Combined treatment with a daily dose of 1,000,000 units of penicillin and 1.2 gm. of streptomycin daily proved superior to treatment with a daily dose of 2,000,000 units of penicillin alone in one patient in whom a penicillin-sensitive but streptomycin-resistant strain of alpha-hemolytic streptococcus was demonstrated. Today combined treatment is the method of choice in resistant cases. It seems to have a bactericidal effect, while aureomycin and chloramphenicol (chloromycetin®) may have only a bacteriostatic effect similar to that of the sulfonamide compounds. Evidence of diffuse or circumscribed myocardial lesions was supplied by electrocardiograms in all 10 patients. Resistant infection and cardiac decompensation are the two main causes for the relatively unfavorable prognosis in subacute bacterial endocarditis. The follow-up period has been relatively short in the author's patients, and exacerbation of the defect of the cardiac valves and of the condition of the myocardium is likely. Early diagnosis seems to be decisive with respect to prognosis, although that has not been definitely proved because of the great variations of the disease.

Semaine des Hôpitaux de Paris

27:1027-1126 (April 2) 1951. **Partial Index**

Recent Progress in Surgical Treatment of Esophagus. D. Adler.—p. 1028.
Primary Carcinoma of Liver in Bantu Races in South Africa. C. Berman. —p. 1034.
Poliomyelitis in South Africa: Study of Its Racial Incidence. J. Gear. —p. 1043.
•Infantile Hemiplegia and Its Treatment by Hemispherectomy. R. A. Krynauw.—p. 1091.

Hemispherectomy in Infantile Hemiplegia.—Hemispherectomy, not including the thalamus and the caudate nucleus and its tail, was performed in 14 patients between the ages of 7½ months and 21 years with infantile hemiplegia. There was one postoperative death, and treatment failed in another patient because of postoperative infection due to the formation of an abscess in the remaining basal portion. Results were highly satisfactory in 12 patients. Ten of these 12 patients had focal or generalized epileptic seizures before the operation, but none of them had attacks postoperatively. The pronounced disturbances of behavior and personality in all the patients were improved to a greater extent than had been expected. This improvement depends on the integrity of the remaining hemisphere and on its capacity for normal *function as soon as it has been freed from the abnormal* influence of the pathological side. The improvement of tonus and of function with return of motor power and diminished spasticity and clumsiness was significant. Reactions to pinpricks were good in all regions of the body, and articular sensations were restored at least in two patients. The preservation of the caudate nucleus is necessary for the restoration of the motor activity, while the putamen of the lentiform nucleus and the globus pallidus should be removed. The author believes that less radical neurosurgery, consisting of local excisions and incisions may occasionally prevent the recurrence of convulsive attacks, but the mental condition of the patient generally will not be benefited. Epilepsy and/or mental disturbances are to be considered as indications for hemispherectomy in patients with infantile hemiplegia.

27:1127-1160 (April 6) 1951. **Partial Index**

Vaginal Radium Therapy by Stilet Furnishing an Axial Source of Irradiation in Cancer of Cervix Uteri. J. Swyngedauw and J. Nuytten. —p. 1127.
Physiopathogenesis of Hyperthyroidism. E. Azérad.—p. 1132.
•Cerebral Pneumatotherapy with Pure Oxygen: Technique, Indications, Biologic Syndrome, Results. P. Abély, P. Borenstein and J. Puech. —p. 1145.

Cerebral Pneumatotherapy with Pure Oxygen.—Cerebral pneumatotherapy with pure oxygen instead of air was practiced in a large number of psychiatric cases in the course of three years. By lumbar puncture 40 to 60 cc. of oxygen was injected into the subarachnoid space in two stages. The amount of oxygen injected equalled the amount of the cerebrospinal fluid removed. The pressure of the cerebrospinal fluid after the second injection was always significantly higher than at the beginning of the intervention. A terminal overpressure is indispensable for satisfactory results. The indications for pneumatotherapy with pure oxygen are the same as for that with air, but the biologic changes obtained within two hours of the intervention differed with the two techniques. Constant hypoglycemia, particularly pronounced in the first hour, was observed after the injection of oxygen in contrast to hyperglycemia after the injection of air. While red blood cell counts showed no changes after the injection of air, there was a definite increase in red blood corpuscles three to five hours after the injection of oxygen, and there was in addition neutrophil hyperleukocytosis at the fifth hour after the injection. The serum calcium level was significantly increased in only two patients, who were spasmophilic. Mild but constant hypoglycorrhachia was observed after the injection of oxygen. Examination of vaginal smears revealed shortening of the menstrual cycle and a rapid increase in acidophil estrogenic cells. Pneumatotherapy proved to be most effective when practiced in the preovulation period. Cerebral pneumatotherapy is to be considered a more satisfactory and less painful method with pure oxygen than that with air. It is suggested that the oxygen exerts an effect on the diencephalon by restoring simultaneously the whole equilibrium in some psychiatric cases. The oxygen injections may be repeated at three week intervals for more lasting results. Pneumatotherapy with oxygen is particularly advised in postpartum psychoses, since constant and permanent results were obtained in about 100 such cases.

Settimana Medica, Florence

38:555-574 (Nov. 30) 1950. **Partial Index**

•Observations on Use of Corticosterone and Ascorbic Acid in the Cure of Arthropathies. G. Tassinari and L. Rindi.—p. 561.
•Therapy of Brucellosis. M. Bassi and S. Menci.—p. 566.

Corticosterone and Ascorbic Acid in Arthropathies.—Tassinari and Rindi administered desoxycorticosterone acetate and ascorbic acid in treatment of arthropathies of different origin and nature in 15 patients of either sex between the ages of 25 and 74. The disease was severe and of several years' duration in all cases. One intramuscular injection of 5 mg. of desoxycorticosterone acetate in oil was given daily, followed immediately by an intravenous injection of a solution containing 1 gm. of ascorbic acid. The injections were given for a period that varied between 10 and 20 consecutive days, except to two patients who wished to discontinue treatment after three and five injections respectively, because of intolerance to it. The effects on pain and muscular function were spectacular but transient in four cases, mediocre and transient in four patients, and nil in seven patients. These drugs resembled cortisone in the clinical effects of the treatment and the lowering of the erythrocyte sedimentation rate several days after administration. The necessary doses, as given to the aforementioned patients, produced toxic symptoms, mainly hypertension with acute headaches, dizziness, in some cases acute or mild pruritus all over the body, and cardiac or renal symptoms in patients with cardiac or renal disease. The toxic symptoms subsided after discontinuation of the treatment. The authors therefore conclude that a definite cure was obtained in no case, but that the aforementioned treatment is of value in arthropathies of recent onset. The treatment is contraindicated for patients with hypertension, arteriosclerosis, or cardiac or renal diseases.

Therapy of Brucellosis.—Bassi and Menci administered one or more modern types of treatment to several groups of patients with acute brucellosis. The authors conclude that chloramphenicol and its synthetic derivatives are of the same therapeutic value as aureomycin in brucellosis. Antibrucellar vaccines, after chloramphenicol therapy, diminish the necessary quantity of the antibiotic and cause a permanent immune reaction. The *administration of neoarsphenamine* followed by administration of antibrucellar vaccines is indicated in very acute cases and when chloramphenicol cannot be obtained. The combined treatments of sulfadiazine, streptomycin, and quinacrine dihydrochloride (atabrine®) or of sulfadiazine, streptomycin, and penicillin provide a rapid and definite cure in cases particularly resistant to usual therapy.

Thorax, London

6:1-102 (March) 1951

Carcinoma of Bronchus: Report on First Five Years' Work of Joint Consultation Clinic for Neoplastic Diseases of the Brompton Hospital and the Royal Cancer Hospital. W. D. W. Brooks, M. Davidson, C. P. Thomas and others.—p. 1.

•Prophylactic Streptomycin in Thoracoplasty Operations: Report to the Medical Research Council.—p. 17.

Lung Resection for Pulmonary Tuberculosis. B. J. Bickford, F. R. Edwards, J. R. Esplen and others.—p. 25.

•Radiological Study of Relationship Between Tuberculosis and Pneumokoniosis in Coal Miners. K. J. Mann.—p. 43.

Hiatal Hernia and Short Oesophagus in Children. E. Husfeldt, G. Thomsen and E. Wamberg.—p. 56.

End-to-End Bronchial Anastomosis After Accidental Division of Stem Bronchus. J. Mathey and G. Oustrieres.—p. 71.

Endometriosis of Pleura. H. Nicholson.—p. 75.

Two Cases of Bronchiogenic Cyst Associated with Anomalous Arteries Arising from Thoracic Aorta. E. Tosatti and J. A. Gravel.—p. 82.

Prophylactic Streptomycin in Thoracoplasty Operations.—A controlled study of the effect of routine streptomycin administration at the time of thoracoplasty is described. Two comparable groups of patients were observed. One group of 325 patients (the S group) received 1 gm. of streptomycin daily for two days before and 21 days after each operation or stage. The local application of 1 gm. to the wound at the time of operation was optional. Another group of 287 patients (the control or C group) received no streptomycin locally or intramuscularly before or after operation unless they were considered to have a tuberculous lung "spread" or a tuberculous wound infection. In the event of any complications, patients from either group were given 1 gm. of streptomycin daily for eight weeks or for four months, if necessary. The incidence of contralateral spread did not differ significantly between the two groups, but there was a significantly greater number of homolateral spreads in the controls than in the S cases. There was no significant difference between the groups in the incidence of transient or persistent atelectasis after operation. The incidence of serious wound infections was significantly greater in the controls. Sputum examination three months after operation did not show any statistically significant difference between the S and C groups. The total deaths, up to six months after operation, included six in the S group and eight in the C group. In the control group 11.6% of the men but only 4.0% of the women had homolateral spread postoperatively, whereas 8.7% of the men and only 2.4% of the women had operation wounds unhealed after three months. The routine use of streptomycin prophylactically in thoracoplasty operations is not advocated. The drug is best reserved for treatment of complications.

Tuberculosis and Pneumonoconiosis in Coal Miners.—A study of the development and progression of tuberculous shadows in the roentgenograms of coal miners is reported. In all, there were 1,514 pairs of roentgenograms. In 139 pairs the first showed a tuberculous shadow of clinical significance, and these 139 were used for the study of the progression rate. The remaining 1,375 pairs were used for study of the attack rate of tuberculosis, which, in the reinfection type of tuberculosis, was found to be related to the severity of the associated simple pneumonoconiosis. It is apparently reduced in cases of complicated pneumonoconiosis. The progression rate of tuberculosis in the presence of simple pneumonoconiosis is apparently slow. The prevalence of tuberculosis appeared to be higher among miners with simple pneumonoconiosis than in the general population. This high prevalence is related to the higher attack rate and lower progression and mortality rates from tuberculosis in miners compared with the normal population. Progressive massive fibrosis, characteristic of complicated pneumonoconiosis, may in itself be a modified form of tuberculosis occurring in a lung already affected by simple pneumonoconiosis.

Tubercle, London

32:49-72 (March) 1951

Domiciliary Use of Paramisan Sodium in Treatment of Pulmonary Tuberculosis. D. L. Pugh and E. R. Jones.—p. 50.

Diffuse Encephalopathy After Streptomycin Treatment. J. R. Edge.—p. 58.

32:73-96 (April) 1951

Anti-Tuberculosis Work in County of Uppsala, Sweden: Part II. BCG Vaccination, Morbidity and Mortality in Tuberculosis. E. Hedvall. —p. 74.

Investigation into Effects of Tuberculous Infection on Physical Growth of Children. B. Benjamin and F. A. Nash.—p. 82.

Treatment of Tuberculous Empyema by Aspiration. A. H. M. Siddons and M. L. Konstam.—p. 85.

Ugeskrift for Laeger, Copenhagen

113:277-306 (March 8) 1951

Renal Acidogenesis. K. Lundbaek.—p. 277.

•Combination Resection-Injection Treatment of Varicose Veins: Follow-Up Examination. A. Birch-Jensen.—p. 281.

Maintenance of Open Air Passage in Unconscious Patients. E. Nilsson and J. Marquardsen.—p. 286.

Experiences with Narco-Electro-Curare Shock: Preliminary Report. J. Kaldan.—p. 287.

"Septacrol" (Ciba). F. Tvedegaard.—p. 288.

Combination Resection-Injection Treatment of Varicose Veins.—Birch-Jensen says that varices are chiefly treated in four ways: conservatively, surgically, by injection, and by combined surgery and injection. Combined resection and injection has been used at Aarhus Municipal Hospital since 1947. Follow-up examination was made in 129 cases, in 75 men and 54 women, operated on from 1947 to 1949. In most cases the disorder had been present from 15 to 20 yr. There was at least nine months' observation time. Completely satisfactory objective results were seen in 66% of the cases and more or less pronounced recurrence in 34%. Subjective results were better than objective ones.

113:353-374 (March 22) 1951

•Acquired Toxoplasmosis: Seven Cases of Strongly Positive Toxoplasma Reactions. J. J. C. Siim.—p. 353.

Demonstration of Tubercle Bacilli in Stomach Resection. K. Iversen and W. Kiaer.—p. 358.

Acquired Toxoplasmosis.—Seven cases of acquired toxoplasmosis, all with strongly positive Toxoplasma reaction, are reported. The main symptom was a pronounced pathological swelling of the lymph glands. In three patients universal adenitis was the only symptom, in three there were fever and uncharacteristic catarrhal symptoms, and in one pronounced fatigue. There was no exanthem, and the Wassermann and Paul-Bunnell reactions were negative. The glandular swelling lasted several months, and in three cases convalescence was characterized by much fatigue. No changes in the central nervous system and eyes such as dominate the picture in congenital toxoplasmosis were observed. Acquired toxoplasmosis may run its course as an inapparent infection. The author considers it likely that in the future positive Toxoplasma reactions will be found in at least some of the cases clinically diagnosed as mononucleosis. The natural mode of infection is not known, but the possibility of transmission through the alimentary canal as well as by insects must be considered.

Wiener klinische Wochenschrift, Vienna

63:125-140 (Feb. 16) 1951

Diagnosis of Congenital Cardiac Defects Suitable for Surgical Intervention. E. Mannheimer.—p. 129.

•Cerebral Lobectomy. K. Huber.—p. 134.

Immediate Satisfactory Results of Extirpation of Larynx for Carcinoma. O. Novotny.—p. 135.

Cerebral Lobectomy.—Lobectomy was performed on 13 patients, three men and 10 women between the ages of 20 and 50, of whom five had an oligodendroglioma and eight an astrocytoma. The frontal lobe was excised in 10 instances and the occipital lobe in three. Three patients died soon after the operation, but residual tumors were not demonstrated on necropsy. These patients died from acute anemia; preserved blood was not yet available for transfusion at the time of the operation. Four other patients died in one to seven years after the intervention. Necropsy was performed in two of them, and it revealed recurrences of the tumors. Two other patients were followed for three years and were free of complaints. The last four of the 13 patients answered a questionnaire. One operated on 12 yr. ago still had epileptic attacks and was blind, but already was so at the time of operation; two operated on one and six years ago had occasional attacks, but their working capacity was partially restored. The last remaining patient, operated on eight years ago, recovered completely and is able to do agricultural work. Homonymous hemianopsia occurred after the excision of the occipital lobe in two patients, but the patients were not much disturbed by it. An insignficant decrease in function occurred after frontal lobectomy in two other patients. The indications for lobectomy were justified in these 13 patients except for the two with recurrences. In spite of careful microscopic examination of the tumor in the course of the intervention, recurrences cannot always be avoided, because the extension of the tumor may not be visible macroscopically and it may not be possible to establish the presence of multiple tumors. The author believes that only frontal or occipital lobectomy is indicated and that either should be performed only for astrocytoma and oligodendroglioma. Diagnosis based on ventriculography should not alone be decisive for performance of lobectomy; the general condition of the patient must also be considered, and the definite decision should be made only after exposure of the brain. Lobectomy should not be performed as palliative treatment, since the result that may be expected will not justify the magnitude of the intervention.

63:249-264 (April 6) 1951. Partial Index

Serum (Plasma) Proteins in Health and Disease. R. Bauer.—p. 254.
Eclampsia Induced by Neurovegetative Disturbance of Circulation. H. Knaus.—p. 257.
*Treatment of Gonorrheal Vulvovaginitis with Penicillin. H. Peer.—p. 261.

Penicillin in Gonorrheal Vulvovaginitis.—Twelve female infants with gonorrheal vulvovaginitis were treated with penicillin. Fifty thousand units of the antibiotic were injected every three hours, with a total dose of 500,000 units. Local treatment was not given. The author advises against hormone therapy as an unphysiological procedure in the infant. Untoward reactions to penicillin were not observed. All the infants made a complete recovery. They remained in the hospital for an average period of one month. Cultures and microscopic follow-up studies were done for six months. Despite the unfavorable reports by other workers, penicillin therapy is considered the method of choice for gonorrheal vulvovaginitis in infants, provided that the adequate total dose of 500,000 units is administered. Combined treatment with estrogens or sulfonamide compounds is not necessary.

Zeitschrift für klinische Medizin, Heidelberg

148:1-118 (March 12) 1951. Partial Index

Pathogenesis of Atypical, Shortened AV-Conduction (Wolff-Parkinson-White Syndrome). E. Gadermann.—p. 1.
Faulty Regulation of Water Metabolism in Patients with Diseases of Diencephalohypophysial System. H. Leveringhaus.—p. 12.
*Clinical Picture and Therapy of Endocarditis Lenta with Particular Consideration of Treatment with Streptomycin and Massive Doses of Penicillin. H. Kleinfelder.—p. 53.

Treatment of Endocarditis Lenta.—Forty patients, 37 men and three women, between the ages of 20 and 40, with endocarditis lenta are reported on. Nineteen patients had a defect of the cardiac valves that preceded the endocarditis lenta. The clinical picture of the disease was highly characteristic, with the organic heart defect detected by auscultation, enlargement of the spleen, focal nephritis, extremely increased blood sedimentation rate, temperatures ranging from subfebrile to fever, and clubbed fingers. Since January, 1948, 32 of the 40 patients had been treated with antibiotics. Seven patients were treated with 500,000 units of penicillin daily for 28 days, according to Christie's schedule, but a cure was not obtained in any of these patients, although the daily dose was increased to 800,000 units, with a total dose of 30 million units. Recovery resulted in seven of 11 patients who received massive doses of penicillin up to 6,000,000 units per day for eight weeks. Only temporary improvement had been obtained previously with smaller doses of penicillin in these patients. Twenty patients were given daily doses of 1 to 2 gm. of streptomycin, up to a total dose of 90 gm. Four patients recovered, and another was expected to. Four of these patients had responded only partially or not at all to previous treatment with penicillin. Streptomycin should be given a therapeutic trial in every case in which the symptoms of infection may not be satisfactorily improved by appropriate doses of penicillin. Since January, 1949, 12 of 21 patients who were treated with massive doses of penicillin and to whom streptomycin was given as an adjunct have definitely recovered. Recovery was expected in another patient. It should be emphasized that these highly satisfactory results were obtained in 62% of patients who had been ill for more than six months before treatment was instituted. Experience showed that prognosis of endocarditis lenta is unfavorable in patients with aortic insufficiency and pronounced hemodynamic manifestations; the occurrence of cardiovascular decompensation must be expected in the majority of these cases. The prognosis is more favorable in patients with a pure mitral effect, stenosis of the aorta, or aortic insufficiency not associated with hemodynamic manifestations.

Zentralblatt für Chirurgie, Leipzig

76:161-224 (No. 3) 1951. Partial Index

*Prophylaxis and Therapy of Thromboembolism and of Postthrombotic Disturbances. H. A. Thies.—p. 164.
Study of Metabolism in Patients After Gastrectomy. K. Kremer.—p. 178.
Pyocyaneus-Meningitis After Lumbar Puncture. H. Reitter.—p. 181.

Prophylaxis and Therapy of Thromboembolism.—Of 1,229 patients who underwent major surgical intervention at the university surgical clinic in Hamburg in 1950, 40 (3.3%) had a postoperative thrombosis and six (0.5%) had a pulmonary embolism. One of these six patients died before medicinal treatment could be instituted. Postoperative prophylaxis of thrombosis with bishydroxycoumarin (dicumarol®) was given only to adipose and cachectic patients, to those with varicose veins, and to those with a history of previous thrombosis. Bishydroxycoumarin treatment was instituted on the third to fourth postoperative day with a dose of 200 mg. daily for the first two days. Subsequent doses depended on the prothrombin time, which was determined daily and maintained as nearly as possible between 20 and 40% of normal. In addition, 400 mg. of pure rutin was given daily for the protection of the vascular wall. Hemorrhages did not occur during this prophylaxis. So that the process of wound-healing would not be interfered with, heparin was not administered during the first 24 to 48 hr. necessary for bishydroxycoumarin to become effective. Not a single instance of thrombosis or embolism was observed during this prophylactic treatment, but the number of patients so treated was too small for definite evaluation of bishydroxycoumarin prophylaxis. Treatment of thrombosis or thrombophlebitis with bishydroxycoumarin was combined for the first three days with moist dressings and raising of the extremity, since heparin was not available. Hypoprothrombinemia of at least 20% and even less was the goal as long as symptoms of thrombosis were still manifest. Moist dressings were discontinued as soon as a prothrombin time of 30% was obtained; when it oscillated around 15% (usually after five days) the patient was allowed to move the extremity at will. Pain and tension usually disappeared within four to six days, and the duration of the thrombosis was shortened to eight to 15 days. Mild, short embolic attacks occurred in only 10 patients but did not necessitate special measures. Daily determination of prothrombin time, immediate institution of bishydroxycoumarin, and sufficient hypoprothrombinemia are indispensable for cure. The author's results as well as those reported in world literature showed that the anticoagulants are superior to any other drug used for prophylaxis or treatment. Although the anticoagulants were not always effective, the incidence of thrombosis, its duration, and the incidence of fatal embolism were much reduced. Severe hemorrhage may occur in about 2% of the cases, but death may be prevented nearly always with transfusions of fresh or preserved blood with sufficiently high prothrombin content. Heparin and bishydroxycoumarin do not clear up postthrombotic disturbances.

BOOK REVIEWS

Fundamentals of Clinical Fluoroscopy with Essentials of Roentgen Interpretation. By Charles B. Storch, M.D., Adjunct, Radiodiagnostic Department and Radiotherapy Department, Beth-El Hospital, Brooklyn, New York. Cloth. $6.75. Pp. 196, with 217 illustrations. Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1951.

To an old radiologist trained in the Holzknecht (Vienna) and the Levy-Dorn (Berlin) early schools of roentgenology, there is a nostalgic and comforting thrill to this author's attempt to arouse or revive an interest in fluoroscopy. The technological triumphs of modern radiography would seem to eclipse the fundamental and clinical satisfactions inherent in fluoroscopy. Of course it is essential that plenty of clinical experience enter into the interpretation of the fluoroscopic images, and it is also important to observe the demands for protection of both patient and fluoroscopist. As the author states, the literature of fluoroscopy is scarce and scattered. It is a neglected waif of radiology. The author also admits a Socratic adherence to logic and answerableness that is commendable. The author does not presume that fluoroscopy is a competitor to roentgen films. Rather fluoroscopy amplifies and frequently serves to avoid an unusual number of films for the patient in whom the movement or pressure displacement of viscera needs to be surveyed. The thoracic cage becomes an alluring and resourceful field for fluoroscopy, with its shift of fluid level, the diaphragmatic excursion, and the mediastinal variations by position. Abdominal emergencies of various types of gas retention from several causes can be studied without the inevitable delays of radiography. Now that amplification of fluoroscopic images with substantial gains in visual acuity and increased brightness of the screen images is available, there is every reason for one to believe that this revival of fluoroscopic interest is more than justifiable. Fluoroscopy must and will emerge from this tunnel of darkness in which it has been for decades. But there must be full understanding and observance of the demands of protection and the necessity of familiarity with normal and abnormal fluoroscopic anatomy and physiology, in addition to a full measure of clinical comprehension. Radiologists of this generation have had little experience with fluoroscopy compared to the first generation of continental radiologists who were trained with glass plates without even screens to intensify images. It is going to be interesting to witness this revival of simple fluoroscopy. This good book can show the way.

Therapie der Nerven- und Geisteskrankheiten. Herausgegeben von Wolfgang Holzer, Professor Dr.med. et Dr.Ing., Vorstand der psychiatrisch-neurologischen Universitätsklinik in Graz. Unter Mitarbeit von Hans Eichhorn, et al. Redigiert von Ernst Pichler. Cloth. Pp. 407, with 28 illustrations. Wilhelm Maudrich, Spitalgasse 1B, Wien IX/2, 1951.

The editor, Dr. Holzer, restricts himself to a general medicophilosophical introduction and relegates the main task to his associates. This treatise covers all types of therapeutic procedures, such as pharmacotherapy, physical therapy, therapeutic operations on the central and peripheral nervous system, specific therapy in diseases of the brain and meninges, treatment of neurosyphilis, and other diseases of the spinal cord, peripheral nerves and neuromuscular system. There are chapters on diagnostic procedures, shock treatments, convulsive disorders, psychotherapy, therapeutic use of hormones, vitamins, diets, and therapy of acute injuries to the central nervous system.

This monograph contains little that is of value to the practicing neurologist or psychiatrist. It is filled with therapeutic suggestions that have been gleaned from the literature of the past century and put together without critical evaluation. Most of the recommended forms of therapy are obsolete; to mention a few striking examples, leeches in cerebral hemorrhage, mercury and bismuth in central nervous system syphilis, morphine in postconcussion delirium, convalescent serum in epidemic encephalitis, and malarial fever treatment of acute anterior poliomyelitis. On the other hand, established methods of treatments which have been in use for a number of years are omitted or barely considered; for example, penicillin in neurosyphilis, the surgical procedures in cerebral aneurysms, and the value of the newer antibiotics. Many disease entities are not considered. The importance of the electroencephalogram in diagnosis and control of treatment of epilepsy is overlooked, and topectomy, transorbital lobotomy, and electronarcosis in the treatment of mental disorders are not mentioned.

These are but few examples of the defects of this monograph. It gives the impression of a book written in haste, by authors who have had little practical experience and who do not have the critical judgment which is needed in writing on subjects of therapy. Some of the defects may be excused on the basis that progress in medical science has been retarded in Austria by the war. This does not, however, excuse the lack of order in the presentation of the material and the failure of the authors to use discrimination in the selection of methods of therapy.

The printing of the book is good, but the binding is weak and easily broken. There are 28 illustrations, most of which pertain to the technic of lumbar and cisternal puncture and do not add to the value of the book. There is an inadequate bibliography at the end of each chapter. Practically all the references are to the German literature. References to the foreign literature cited in the text are not included in the bibliography. There is an adequate index.

Therapies in all fields of medicine are changing rapidly. The authors have not kept apace with the advances in the field of neurology and psychiatry. Their monograph is not, therefore, of any value to the student or to the specialist.

Roentgenologic Diagnosis of Diseases of Bones. By David G. Pugh, Assistant Professor of Radiology, Mayo Foundation, Graduate School, University of Minnesota, Minneapolis. [Reprinted from Nelson's loose-leaf Diagnostic Roentgenology.] Cloth. $6. Pp. 316, with 307 illustrations. Thos. Nelson & Sons, 19 E. 47th St., New York 17; Parkside Works, Dalkeith Road, Edinburgh 9, 1950; 1951.

This book is the section with the same title in Nelson's looseleaf "Diagnostic Roentgenology," edited by Dr. Ross Golden, Chief of the Department of Radiology at the Columbia Medical Center at New York City. This original section was written by Paul Hodges, Phemister, and Brunschwig. Pugh has retained much of the original section, which he acknowledges, and has added much, especially on the endocrinal, vitaminic, rheumatoid, neurologic, hematologic, and orthopedic categories of bone disease. Fractures are not discussed as such, but fractures as complications of systemic bone disease receive good attention. The dystrophies of bones receive elaborate attention, as do also bone tumors. There used to be about four bone diseases, to wit: tuberculosis, osteomyelitis, syphilis, and cancer. When improved sanitation methods for cattle and milk were adopted, the virtual elimination of tuberculosis followed. The sulfonamides have about eliminated osteomyelitis. Penicillin has conquered syphilis, and now the problem of malignancy is about to be solved. But a new array of bone diseases have arisen to baffle diagnostic skills. Pugh's book provides the avenues of analytical roentgen diagnosis. No longer does the orthopedist alone treat bone disease and trauma. Now the endocrinologist, the rheumatic and cardiac specialist, the neurologist, and others are appropriating treatment of bone diseases, each into his own specialty. But a book like this will help any and every specialist. Perhaps general practitioners might and could appropriate this whole field of the newer diseases of bone, saving the radiologist as the court of last resort.

Pugh's book is worthy of the author and his background. If Pugh has missed any of the new expressions of bone disease, it is just because they have not as yet been discovered. When bigger and better bone diseases are provided, Pugh can add appropriate postscripts.

The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

QUERIES AND MINOR NOTES

TRANSMISSION OF RABIES

To the Editor:—*1. Can a flea biting a rabid animal transmit rabies? 2. Can chickens contract the disease from a rabid animal? If so, can the fowl transmit the disease to an animal or human? 3. If a pregnant rabid dog is delivered by cesarian section and the mother animal has no contact with the litter, can the puppies develop rabies? If the veterinarian punctured his hand with the knife or needle during the operation, would he contract rabies? 4. I have been informed by a veterinarian that the virus has been recovered in the urine or milk of a rabid animal or cow. Is that correct? 5. If a dog is immunized against rabies can that animal become a carrier of the virus and infect a person by biting or can he transfer the virus to an unprotected animal?*

Bernard Greenberg, M.D., Brooklyn.

Answer.—1. No, rabies is not transmissible by fleas or any other arthropods. 2. (*a*) Yes, domestic fowl may contract rabies, although they are not so susceptible as mammals. (*b*) No instance is known in which rabies was transmitted by rabid chickens. 3. (*a*) This is a rather hypothetical situation, with which there is little or no practical experience. Natural transplacental transmission following natural infection in dogs has not been recorded. However, Konradi (*Zentralbl. Bakt.* 42 [pt. 1]:203, 1908) observed that rabies could be transmitted by pregnant dogs, following experimental infection, to the fetus and offspring. Other workers have failed to confirm this transplacental passage of the virus. (*b*) This is extremely unlikely in the light of present knowledge. Accidental contamination of the surgeon's or pathologist's wound would be more likely from contact with pancreas, kidney, or mammary glands, since the virus may sometimes be present in these tissues. 4. (*a*) Yes, rabies virus has been recovered from the urine or milk of rabid animals. (*b*) Infection from the handling of infected milk or urine is a very improbable mode of transmission. The danger of such occurrence would depend on the entry of the infected fluid into a substantially severe and fresh wound and also on the concentration of the virus in the contaminating fluid. Ingestion of infected cow's milk is a highly unlikely mode of transmission. 5. No, if a dog is immunized and fully protected, remaining refractory to infection, he will not be capable of transmitting the virus. In dogs there is no evidence of symptomless carriers of rabies whether immunized or not.

TOXICITY OF TITANIUM

To the Editor:—*I would like information on titanium poisoning.* *J. B. Havron, M.D., South Pittsburg, Tenn.*

Answer.—Titanium long has been accepted as without known toxicity. Its commonest form, titanium dioxide, is utilized in high tonnage in paint manufacture under conditions of gross exposure without known injury to workmen. Smaller quantities are introduced into cosmetics and skin medicaments without complaint of undesirable qualities. The term "titanosis" appears in the literature, and here and there cases have been reported in which pulmonary lesions have been attributed to titanium. Usually the onus may be traced to admixed materials such as silica. What has been noted in the case of titanium dioxide is not always true for some other compounds. Various salts may be detrimental, not because of the presence of titanium, but on account of associated radicals. Thus, titanium tetrachloride and titanium potassium fluoride may serve as examples of toxic agents in the action of which titanium itself is unfairly held responsible.

TREATMENT OF GASTRIC CRISES

To the Editor:—*A 51 year old man has had six severe attacks of gastric crises of tabes within the past year. A diagnosis of tabes was made in 1942, and he was given two years' treatment with arsenicals and bismuth. In 1945, he began to have gastric crises and was given 12,000,000 units of penicillin. Fever therapy was given but could not be tolerated. Beginning in August 1950, I gave him 250 mg. of aureomycin four times daily for three weeks. He has had two attacks of gastric crises since then. Five blood tests between 1946 and 1948 showed positive Kolmer (430000 to 444000) and Kahn (012 to 013) reactions. In May 1947 colloidal gold was 1221110000-0 and 12 mononuclear cells were found in the spinal fluid. At present the blood Kahn, Kolmer and Kline reactions are negative. Your opinion as to further treatment would be appreciated.*

Edward C. Halley, M.D., Fresno, Calif.

This inquiry was referred to two authorities, whose respective replies follow.—Ed.

Answer.—Some of these patients seem to progress despite all treatment, but others can be helped by a combination of specific and nonspecific measures. This patient has apparently had adequate amounts of specific therapy, but because of the elevated cell count in 1947 the spinal fluid should be reexamined for evidence of relapse or resistance. If there is any abnormality in cell count, protein, colloidal gold curve or spinal fluid Wassermann reaction, it might be of value to give another course of penicillin (9,000,000 units over a period of three weeks) followed by a reexamination of the spinal fluid in six months. Some syphilologists also give courses of 10 weekly injections of bismuth (bismuth subsalicylate in oil, 1.5 cc. intramuscularly) alternating with two month rest periods as long as the spinal fluid remains positive.

Nonspecific therapy may be of even greater importance. Marked symptomatic improvement often results from the following measures used in combination for many months: large doses of vitamin B complex, daily ultraviolet rays to the entire body, weekly autohemic injections for 10 weeks, elimination of coincidental infection, avoidance of exertion and insistence on adequate sleep with barbiturate sedation if necessary. Morphine should not be used for the recurrent gastric crises. Many patients thus treated die of the effects of addiction rather than from their disease. In the place of morphine, 3.0 Gm. each of chloral hydrate and sodium bromide in 30 cc. of water should be given per rectum and retained. This can be repeated every four hours as needed. Combinations of acetylsalicylic acid, phenacetin and sodium bromide may also be given by mouth for pain. Epinephrine, 0.5 cc. intramuscularly, sometimes stops an attack. Intravenous administration of dextrose and sodium chloride solution is essential if vomiting is severe.

Answer.—Gastric crises in tabes dorsalis are rarely benefited either by metal chemotherapy, penicillin, or any other form of drug therapy. There is perhaps a 25 per cent chance of complete relief and a 50 per cent chance of marked amelioration (in decrease of frequency and severity of attacks) if the patient can be properly treated with fever by means of induced tertian malaria. Whether this can be accomplished depends in part on his physical status and in part on the expertness of medical and nursing care during the malaria. If malarial therapy is without avail (and it should certainly be tried, if possible, before anything else), there remain only two possible recourses. The first of these is control of the attacks by means of morphine or a derivative, which obviously incurs the grave risk of addiction. The second is one of the several neurosurgical procedures that have been utilized with more or less success in the treatment of this condition. The most satisfactory of these operations is probably cordotomy, or combined sympathectomy and vagotomy.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

DENTIFRICE CONTAINING FLUORIDE

To the Editor:—*Is there any evidence on the desirability of using aqueous sodium fluoride solution brushed on the teeth daily? What strength would be considered most suitable?*

A. McQ. Thomson, M.D.,
Middle Park, Victoria, Australia.

Answer.—The results of a clinical study (Bibby, in "Dental Caries-Mechanism and Present Control Technics," St. Louis, C. V. Mosby Company, 1948, p. 151) in which children used a liquid dentifrice containing sodium fluoride do not support this suggestion. No reduction in dental caries was observed at the end of one and two years.

Indiscriminate distribution of even a 0.5% solution of sodium fluoride may not be free of hazards. The possibility that death of an adult human might result from the absorption of as little as 105 mg. of fluorine has been indicated (Gettler and Ellerbrook: Toxicology of Fluorides, *A. J. M. Sc.*, **197**:625 [May] 1939). This is the amount of fluorine in 50 cc. of a 0.5% sodium fluoride solution. An LD_{50} of 50 mg. or more per kilogram of body weight may be a better estimate of the acute toxicity of sodium fluoride (McNally: Four Deaths Caused by Sodium Fluoride, *J. A. M. A.* **81**:811 [Sept. 8] 1923; Cox and Hodge: Toxicity of Fluorides in Relation to Their Use in Dentistry, *J. Am. Dent. A.* **40**:440 [April] 1950). Even this value shows the dangerous potentialities of 0.5% solutions if made accessible to children.

CANCER AND THE PITUITARY GLAND

To the Editor:—*Has research been done on a possible correlation of cancer and the anterior pituitary?*

M.D., New York.

Answer.—There are no definite data in the clinical literature that demonstrate a direct correlation between the function of the anterior pituitary and the development of cancer. Certain animal experiments suggest that anterior pituitary hormones may be involved in the development and growth of tumors. Administration of a purified pituitary growth hormone to rats by Moon and his colleagues resulted in the development of neoplasms in several different organs. Administration of other purified pituitary hormones to animals has not been reported to produce neoplasms. Hypophysectomy may alter the rate of growth of certain transplantable tumors in animals.

There is evidence in both man and animals that alteration of the endocrine balance, especially of the adrenal cortex and gonads, can influence the rate of growth of some neoplasms. Alteration of gonadal function in certain strains of animals has been demonstrated to result in the development of neoplasms. Since the endocrine function of the adrenal cortex and gonads is regulated by tropic hormones from the anterior pituitary, it is reasonable to suppose that alterations in the function of the anterior pituitary might influence the development and growth of tumors. Quantitative methods for the determination of anterior pituitary function in man are not adequate to permit critical evaluation. Recent advances in the preparation of purified anterior pituitary hormones will afford an opportunity to determine the effects of these substances when administered to animals and man.

INOPERABLE LUNG CANCER

To the Editor:—*A patient with carcinoma originating in the apex of the left lung has been declared inoperable. Can you give me information as to whether aminopterin or amethopterin would be of benefit in this case?* *M.D., Louisiana.*

Answer.—Aminopterin and amethopterin are folic acid antagonists which are still decidedly in the experimental stage. Also, they are by no means free from toxic effects. There is no good evidence that they will be useful in the treatment of advanced cancer. The article by Schoenbach, Greenspan and Colsky entitled "Reversal of Aminopterin and Amethopterin Toxicity by Citrovorum Factor," which appeared in The Journal Dec. 30, 1950 (page 1558) elaborates on this subject.

HYDROGEN ION CONCENTRATION OF CEREBROSPINAL FLUID

To the Editor:—*1. What is the permanganate or organic index of cerebrospinal fluid? 2. What variation occurs in the hydrogen ion concentration of the cerebrospinal fluid in tuberculous meningitis?*

S. M. Epple, M.D., Cleveland.

Answer.—The permanganate or organic index is a figure expressive of the total amount of organic matter in the cerebrospinal fluid as measured by the reduction of a solution of potassium permanganate of known strength. The normal index for fluid withdrawn by lumbar puncture is 1.3 to 1.8, ventricular and cisternal fluids having indexes which are slightly lower, 1.1 to 1.5. A most marked increase occurs in organic disease of the meninges. High values are found in all disorders associated with increase in the cell and protein content of the fluid. Contamination of the fluid with blood invalidates the results of this test. In general the index parallels the cell and protein content of the fluid. The determination of the permanganate index adds little to the information gained from other, more specific, procedures. The hydrogen ion concentration of cerebrospinal fluid examined immediately after withdrawal is almost the same as that of the blood, the p_H varying normally from 7.4 to 7.6. Levinson has found that when the cerebrospinal fluid is allowed to stand, exposed to air, the alkalinity increases, because of the loss of carbon dioxide from the fluid. The alkaline reserve, as measured by the carbon dioxide-combining power, is also practically identical with that of blood plasma (55-75 volumes per cent).

The p_H of the fluid in tuberculous meningitis is usually within normal limits (7.4-7.6), the alkalinity increasing on standing, as in normal fluid. In the suppurative meningitis the fluid is slightly more acid (p_H 7.2-7.5), the increase being due, in all probability, to the presence of lactic acid. When the fluid is allowed to stand, the acidity shows much less tendency to decrease than in the case of normal fluids, actually increasing in some instances (Levinson). This is perhaps due either to an increased rate of glycolysis or fermentation, or to increased production of carbon dioxide by the cells present in the fluid, balancing the loss of carbon dioxide which occurs when the fluid stands exposed to air.

TREATMENT OF MONILIASIS VULVAE

To the Editor:—*I would appreciate information on the therapy of moniliasis vulvae. Aqueous gentian violet, 2 per cent, has been used as have iodine and vinegar douches. There is no evidence of diabetes mellitus.*

Julius N. Bell, M.D., Kewanee, Ill.

Answer.—It is assumed that by the treatment of moniliasis vulvae, also is meant vaginitis. If the lesion is only of the vulva, other conditions must be thought of, such as kraurosis, leukoplakia, carcinoma, benign warts and ring worm. If it is of the vagina also, use of methylrosaniline chloride (gentian violet) appears to be the treatment of choice. It can be administered several ways:

1. Scrub the vagina with a green soap (not tincture) and paint generously with 2 per cent aqueous methylrosaniline chloride. Repeat in five to seven days until all symptoms and signs are gone.
2. Use methylrosaniline chloride jelly individual dose applicators, inserted like a tampon and insert a tampon afterward, leaving it in for 24 hours. Repeat once a week until cured.
3. Use methylrosaniline chloride suppositories until cured; these when used daily are irritating. Combinations of the above are useful. Propionate compound jelly (propion gel®) has also been reported as helpful.

One should ascertain that a mixed infestation is not present. Trichomonas commonly occurs with yeast; this condition can be treated with diiodohydroxyquinoline or other appropriate remedies. Other lesions, such as cervical erosions, should also be treated. On occasion, overtreatment causes as much or more trouble as the original infestation. In this case, stopping all treatment and merely giving weak vinegar or lactic acid douches will bring relief.

PIGMENTATION FOLLOWING LACERATIONS

To the Editor:—*A patient received facial lacerations in an auto accident. While scars are well healed but irregular, they show deep pigmentation, which extends somewhat beyond the outline of the injury. They are very disfiguring. Please give information as to the permanency of this pigmentation.*

R. C. Hunt, M.D., Fairmont, Minn.

Answer.—Pigmentation of the skin and subcutaneous tissues may result from friction, pressure, heat, other physical and chemical agents, chronic infection, chronic inflammatory processes or wounds. The slightest trauma in dark-complexioned persons may produce an increase in pigmentation. Therefore, it is not unusual for deep pigmentation to form in and around the scars of wounds, especially if the wound took a long time in healing.

Increased pigmentation may be due to increased melanin (iron free pigment), hemosiderin (iron containing pigment) or deposits of foreign or extraneous materials. If foreign or extraneous materials have been tattooed in the wound areas the discoloration may be permanent and require surgery for removal. If the pigmentation is due to hemosiderin or increased melanin, many months may pass before the normal color of the skin returns. In some cases, when the pigmentation is due to increased melanin, it may remain indefinitely.

HIGH DIASTOLIC BLOOD PRESSURE

To the Editor:—*A 39 year old man has a blood pressure of 130/100, otherwise he is apparently healthy. He is 5 ft. 10 in. tall, weighs 195 lb., is a nondrinker and smokes 20-25 cigarets a day. What treatment will lower the diastolic pressure? What may be the significance of the low pulse pressure?*

Daniel Rosenfeld, M.D., Rockville Centre, N. Y.

Answer.—In the first place, it is important that one ascertain that the blood pressure readings are correct. The auscultatory method of blood pressure determination is sometimes open to error because of the occurrence of an auscultatory gap; for example, with aortic stenosis or hypertension or both, there may be an area of auscultatory silence of 20 or 30 mm. above what is erroneously considered the systolic pressure. It is possible that the systolic reading may be 180 with silence from 160 to 120 or 130 with the diastolic reading at 100 or 90. It is even possible that an auscultatory gap may come with relatively low pressure with systolic at 130 and diastolic at 70 and a gap between 100 and 80. A small pulse pressure otherwise suggests aortic stenosis, pericardial constriction, slight diastolic hypertension, which may occur early in the development of essential hypertension (hyperpiesia), or even coronary insufficiency, such as may be found in a few patients at the beginning of their illness with angina pectoris. A relatively high diastolic pressure without systolic hypertension has been seen also in rare cases of coarctation of the aorta. Follow-up studies of this case may prove to be of considerable interest and importance.

URETHRAL PAPILLOMAS

To the Editor:—*Can podophyllin be safely used in the treatment of recurrent urethral papillomas? Can it be instilled directly, thereby bathing normal mucosa as well as pathological mucosa without injuring the former? If not, can it be applied directly to involved areas by endoscope? What percentage and what vehicle is best for such a condition?*

Murray Russell, M.D., Beverly Hills, Calif.

Answer.—Podophyllin (25 per cent) in oil solution or in ointment is effective in removal of urethral papillomas, especially condyloma acuminatum. Although podophyllin has been used along all portions of the urethra and even in the bladder, its use should probably be restricted to warts that occur at or near the urethral meatus. Although it may not cause permanent damage to normal mucosa if washed off in several hours, it can cause severe local irritation and ulceration. In order to avoid subsequent stricture or to prevent overlooking early carcinoma, one should treat deep-seated warts by instrumental methods.

GENITAL TUBERCULOSIS

To the Editor:—*A married woman has had amenorrhea since the age of 17. Her first menstrual period was at age 13, and periods were regular for the next four years, after which she missed months at a time. Two years ago she underwent dilatation and curettage for possible determination of the etiology of her sterility, and a diagnosis of tuberculosis of the endometrium was made from the endometrial scrapings. Physical examination disclosed nothing essentially abnormal. X-rays of the lungs were normal. Results of tuberculin and sedimentation tests were negative. The patient's weight has been more or less stationary, and nutrition has been maintained. The only symptom suggestive of any disturbance has been night sweats, which have subsided with dihydrostreptomycin injections. Any information that you could give me concerning treatment would be appreciated.* *M.D., Rhode Island.*

Answer.—Since this seems to be a local infection in the genital organs (uterus and perhaps tubes), conservative treatment can be advised. First, it is recommended that cervical smears for acid-fast bacilli be made. At this date they may not be found, but a thorough search should be made nevertheless and an animal inoculated. The tuberculin test should be repeated. The reaction should be positive if the process is tuberculosis. Higher dilutions of tuberculin may be required to prove the presence of the tuberculous infection in this type of case.

The treatment with dihydrostreptomycin is entirely rational—about 1.5 Gm. a day for 60 to 90 days. Paraaminosalicylic acid may be given after the dihydrostreptomycin treatment or concurrently with it—about 1 Gm. per 10 pounds (4.5 Kg.) of body weight in four daily doses. It may be dissolved in water and given with fruit juices or other liquids. It is better to give it around meal time, because otherwise it causes irritability and nausea. The sodium salt is much better than the free acid. The free acid may be neutralized by addition of 0.6 Gm. of sodium bicarbonate per gram of drug.

If the symptoms are not controlled by treatment with the respective drugs, or if they recur after the treatment has been finished, surgery should be resorted to. The condition in so many of these cases is controlled and ultimately cured by drug therapy that surgery is rarely necessary.

EARLY CANCER OF CERVIX AND THE SCHILLER TEST

To the Editor:—*Please discuss the Schiller test (Gram's iodine) for early cancer of the uterine cervix.*

Joseph G. McKinnon, M.D., Hattiesburg, Miss.

Answer.—J. P. Greenhill (Office Gynecology, ed. 5, Chicago, Yearbook Publishers, 1949) presents the following data concerning the Schiller test. Kermauner and later Schiller proved that in carcinoma of the portio vaginalis, which constitutes about 96 per cent of the cancers of the cervix, there is such an early stage that it cannot be recognized with the naked eye. In this early stage there is no invasion of the underlying tissue; the only sign of malignancy is a change within the cells. It is well known that the stratified squamous epithelium of the vagina and the portio contains glycogen, provided it does not become keratinized. Lahm observed that this glycogen disappears suddenly when the squamous epithelium changes into carcinoma. Therefore, the proof of the presence or absence of glycogen may serve to distinguish normal from cancerous cells. Schiller discovered a means of detecting this in the living woman in a harmless way. He found that, if an aqueous solution of iodine is poured on the cervix, the normal stratified squamous epithelium of the cervix and vagina assumes a mahogany brown stain in about 30 seconds, whereas carcinomatous areas remain unstained and therefore are whitish. Hence, there is a sharp demarcation between the carcinomatous and the normal epithelium. The iodine solution which must be used is Gram's solution. Schiller advocated Lugol's solution for his test, but he referred to the Lugol solution used for bacterial staining. This is equivalent to our Gram solution, which consists of 1 part iodine, 2 parts potassium iodide and 300 parts water.

A speculum is introduced into the vagina and all mucus and discharge are removed from the cervix and upper part of the vagina. Then 20-30 cc. of Gram's solution is poured on the cervix and upper part of the vagina from a cup or other vessel having a long, sharply pointed tip. The solution is then spread around with a cotton applicator or a cotton pledget. After half a minute the excess of solution is gently absorbed with a pledget of dry cotton. The cervix is then examined carefully in good light. If it is mahogany brown all over, there is no carcinoma, because all the epithelium contains glycogen. If one or more white unstained areas are observed, there is only a suspicion of carcinoma, because not all white areas signify cancer. There are other conditions, benign ones, in which glycogen disappears from the epithelium. Glycogen is always absent in the presence of carcinoma but not only in its presence. In some instances white areas are observed because there is no squamous epithelium, as in the following conditions: (1) trauma, (2) leukoplakia, (3) keratinization developing in a prolapse, (4) hyperkeratosis of the squamous epithelium of the cervix, such as occurs in syphilis, (5) erosions of the cervix and (6) some nabothian follicle cysts superficially situated in the cervix.

Since all white areas are not carcinoma, the only way to determine whether cancer is present is to remove all white areas and have them examined microscopically. Because the carcinoma is limited to the surface cells and there is no invasion of the underlying tissue, all that is necessary is to scrape off the white area with a sharp curet or scalpel or to lift it off with a curet.

Schiller suggested that these pieces of tissue be fixed not in watery formaldehyde but in Carnoy's solution, which consists of 60 parts absolute alcohol, 30 parts chloroform and 10 parts glacial acetic acid.

This test is to be used only when the cervix appears normal to the naked eye, that is, when the squamous epithelium is intact. When an outspoken carcinoma is present with ulceration and destruction of tissue, this test is unnecessary and will fail to reveal the characteristic white areas. The Gram solution must be replenished frequently, because it is essential that it be fresh.

The Schiller test will not reveal an early carcinoma often. However, even if only one early cancer is detected among a few hundred women, detection by the test will probably mean the saving of that one woman's life.

CHRONIC PANCREATITIS

To the Editor:—*What is the present method of treatment of chronic pancreatitis?* *M.D., New York.*

Answer.—The treatment of chronic pancreatitis may be divided into two parts—that concerned with elimination of etiological factors and that directed to relief of symptoms.

1. When a diagnosis of chronic pancreatitis has been established, it is important that the functional state of the hepatobiliary system be determined by thorough laboratory and clinical investigation. In all cases in which chronic pancreatitis is accompanied by evidence of hepatobiliary disease, treatment should first be directed, medically and surgically, to the correction of these defects. When disease exists elsewhere in the gastrointestinal tract, this, likewise, must be corrected by appropriate measures.

2. When etiological factors have been corrected, the remaining treatment of pancreatitis is directed toward the correction of functional errors produced by elimination or reduction of pancreatic enzymes and hormones and, second, by measures directed to relieve the distressing symptoms of the disease. None of these measures will correct the underlying pancreatic abnormal condition. The diet should be high caloric with fat restriction, to reduce the steatorrhea. The amount of fat restriction depends on the degree of steatorrhea. In general, the patient should be able to tolerate from 50 to 100 Gm. of fat. It may be helpful, in addition, to administer bile salts by mouth at meal time to further minimize the symptoms due to a large amount of undigested neutral fats in the gastrointestinal tract. Other medications should be administered as follows: pancreatin in large doses, up to 15 Gm. daily divided equally between the three meals or, preferably, the triple strength pancreatin in correspondingly lesser doses; calcium to replace that lost in the feces, and supplementary vitamin B complex. If diabetes mellitus is present, it may be of a severe grade and may require large doses of insulin for control. Surgical intervention is indicated for cysts, abscesses, pancreatic calculi, obstruction to the pancreatic duct system and intractable pain. In the latter case, sympathectomy has been reported to be of some value. The inquirer is directed to a complete survey of this situation reported by Comfort, Gambill and Baggenstoss (*Gastroenterology 6:239 [April]; 6:376 [May] 1946*). The indications for surgical treatment of chronic pancreatitis are thoroughly discussed in this article.

TRICHIASIS

To the Editor:—*An elderly physician diagnosed trichiasis in his left eye in August 1949. A well known eye man removed two inverted lashes. A similar condition was treated at practically monthly intervals during the remainder of the year. In 1950 the patient was annoyed by inversion in one or both lids 14 times at intervals of three to 10 weeks. On April 25, 1950, in addition to plucking two lashes from the upper lid and three from the lower, the oculist removed a sac of calcium from the outer canthus of the same eye. Two lashes were removed from the lower lid, on December 27, and a similar sac in the same place was treated in April. Three eminent oculists say the condition is likely to continue indefinitely and that the etiology is not known. Can you give any advice?* *M.D., New Jersey.*

Answer.—Minor trichiasis is usually treated by electric epilation of the offending lashes. Where the condition is persistent and more widespread, "Ziegler" cautery punctures are done in the skin near the outer lid margin to promote ectropion from controlled scarring. Severer trichiasis, if due to entropion, is treated by a "skin-muscle" operation. The offending spastic marginal muscle is removed and the tarsal plate grooved, and the lid heals in good position. Recurrent calcium deposits in and under the conjunctiva require general treatment for calcinosis and local conjunctival treatment. The general treatment for calcinosis should include reduction in the use of vitamin D. Locally in the conjunctiva the calcium plaques are removed and a mild collyrium should be persistently used for conjunctivitis. Irrigations of upper and lower canaliculi should be done to insure freedom from a chronic infection, such as Streptothrix.

TINNITUS RESULTING FROM ACOUSTIC TRAUMA

To the Editor:—*A 60 year old man complains of tinnitus (left ear), following a gunshot explosion three years ago. He has been treated by ear specialists and neuropsychiatrists, with no improvement. I have tried foreign protein; histamine, diathermy, nicotinic acid, vitamin E, testosterone, diethylstilbestrol and calcium gluconate intravenously and iodides. Can you suggest anything else that might be tried?*

W. J. Hossley, M.D., Deming, N. Mex.

Answer.—Tinnitus can be relieved by therapy only when it is due to reversible ear pathology, such as occlusion of the eustachian tube, impacted cerumen, otitis media or otosclerosis (in which the fenestration operation frequently, but not always, improves the tinnitus). When tinnitus is a result of acoustic trauma following gunshot explosion, there is damage to the cochlea which is irreversible and therapy is of no value. The patient must be encouraged to learn to live with his subjective head noise. A mild nerve sedative may be of slight help.

MONGOLISM

To the Editor:—*A 3 month old mongoloid infant is the fifth child. The other four are normal. The mother, age 38, had a thyroidectomy for a large adenoma in 1947. Is there any relation between the thyroidectomy and the mongoloid child?*

G. A. Goshgarian, M.D., Round Lake, Ill.

Answer.—As far as can be determined, disease of the maternal thyroid gland plays no role in the etiology of mongolism in the offspring. It is rare for more than one mongoloid child to be born in a family. On the other hand, the condition has been observed in brothers and sisters a number of times. Mongolism may occur either early or late in the reproductive life of the mother. It occurs much more frequently at the latter time. There is no treatment for the condition.

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THE SPECIALIST LOOKS AT EVERYDAY MEDICAL CARE IN INDUSTRY: ORTHOPEDICS

Harvey E. Billig Jr., M.D., Los Angeles

Industrial medicine has of recent years grown into a broad specialty, embracing the fields of preventive medicine, safety, and toxicology, as well as all the ordinary medical specialties.

Paralleling this growth have been three major developments with which industrial medicine has had to be integrated: The first has been the tremendous advance in medical knowledge; examples are the effects on both medical and surgical care of the discovery of the various antibacterial agents and of the metabolic action of the steroid-producing endocrine glands. The second development has been the change in labor-management policy brought on by the slowing of the tide of immigration from Europe, forcing the long-term employment of the mass of workers as ready replacements became unavailable. This stimulated closer study of industrial injuries in order to ascertain methods of prevention and care so as to conserve the labor force. Such studies gave rise to industrial accident commissions to adjudicate awards. The third development has been the trend toward pensions and care for both industrial and nonindustrial disability, bringing with it at the same time a tug of war among the various plans for provision of pensions and care: (*a*) industrial accident insurance company types with cost-plus premium, based on the average of costs of previous years; (*b*) self-insured types, aimed at reducing costs and protecting the worker; (*c*) Government types, involving social security; (*d*) union types, so far dealing chiefly with pension provisions. The scope of orthopedics in industry hence encompasses the care of the individual person from insemination to dissemination, including pregnancy as well as senility.

FIBROUS CONTRACTURE

There are many good books on fractures, dislocations, burns, tendon injuries, etc. However, a need also exists for practical knowledge of the bodily processes, involving, first, growth and development (anabolic dominance); second, intermediary processes, and then senility (catabolic dominance).

A study of the applied physiology of fibrous-tissue metabolism throughout life's cycle gives a remarkable view of the etiological basis and a key to the therapeutic correction of many of the common orthopedic complaints met with in industry.

A vast framework of fibrous connective tissue develops to furnish the ties that hold the body together. Areolar tissue lies beneath the skin; fibrous tissue sheathes each muscle fiber and muscle, nerve fiber and nerve, blood vessel, lymphatic, liver cell and lobe of the liver, and so on, ad infinitum. The sheathings take on denser proportions to assume the characteristics of fascia, to segregate and encapsulate the various structures of the body; of ligaments, to hold the joints together, and of special ligaments, to perform particular functions, such as the inguinal ligament, iliotibial band, and ligamenta flava.

Many examples of healing of localized injury show that, just as in wound healing, there is an increased production of fibrous tissue, which then contracts. In Volkmann's ischemic contracture the muscles become nearly completely replaced by fibrous contracture.

The tendency for fibrous tissue to contract, and hence constrict, is recognized as one of the fundamental properties of all protoplasm. This contracture may be a localized one, as in a wound healing; an areal one, as in Volkmann's ischemic contracture, a sprained joint, or a torn muscle; a multiarticular one, as in arthritis (steroid metabolism); a multiosseous one, as in osteitis fibrosa cystica (parathyroid origin). Even the simple process of an unaccustomed "hike" will result in sufficient irritation stimulus to the fibrous tissue to cause it to contract and produce a stiffness the next and following day. Athletes, dancers, gymnasts, and cats all know that they must counteract the stiffening by means of mobilization stretching, and that as the years go on the tendency to tighten up becomes greater, so that the boxer at 30 is no longer as agile as he once was.

Combating the fibrous capsular and ligamentous stiffness in joints, the consulting physician in physical medicine at St. Thomas' Hospital, London, Dr. James Mennell, has recently rewritten a two-volume book [1] on painless joint-mobilization manipulations covering the entire body.

Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 28, 1950.

[1] Mennell, J.: The Science and Art of Joint Manipulation, ed. 2, Philadelphia, The Blakiston Company, 1949.

METABOLIC CHANGES

Many years ago, Dr. F. L. Hisaw started investigation of steroid metabolism, and in 1926 published his earlier studies of its effect upon relaxation of fibrous tissue (ligaments).[2] Now a host of workers throughout the world are studying the effects of the steroids on control of the fibrous (collagenous) tissue diseases, so that almost weekly are announced new discoveries that additional diseases are to be classified as such and are susceptible to steroid therapy.

A frequent complaint of industrial workers is that of persistent disability due to joint pain and swelling after an injury that, in many instances, should have been expected to clear up after only a brief interval. In examining these workers, it can be noted that a high percentage present the picture of vasomotor instability, with flushed ears and hands, low energy, labile low blood pressure, doughy consistency of muscles, tophi on the ears, and a record of some emotional imbalance. Adrenal cortex extract, if carefully given, will, over a period of four to six weeks, markedly reduce the disability, which is really a gouty diathesis based on a hypoadrenia and flared up in a joint by localized trauma. It has been noted that colchicine not only is an alkaloid but has the qualities of a steroid, and, if it is given by mouth to effective dosage (just short of producing nausea, intestinal cramps, or diarrhea), use of the other steroids can be discontinued after a time and the patient will stay balanced and free of symptoms.

High-Protein, Very Low-Carbohydrate Diet

May Have	
Vegetables	
Avocados	Broccoli
Cabbage	Brussels sprouts
Celery	Cauliflower
Cucumbers	Eggplant
Endive	Kale or collards
Lettuce	Leeks
Olives	Mushrooms
Radishes	Okra
Tomatoes	Rhubarb (no sugar)
Tomato juice	Sauerkraut
Water cress	Spinach
Artichoke	Squash
Asparagus	Swiss chard
String beans	Carrots
Beet greens	Onions
Beets	Rutabagas
Turnips	
Fruits	
Papaya	Muskmelon, cantaloupe, honeydew melon
Grapefruit	Strawberries
Grapefruit juice (no sugar)	Watermelon
Lemons	
Meats	
Bacon	Liver
Beef roast	Lean meat
Beefsteak	Pork chops
Beef	Sweetbread
Chicken	Turkey
Ham	Veal cutlets
Heart	Veal roast
Lamb	Fowl
Fish	
Bass	Sardines, canned
Codfish	Trout, brook, lake
Halibut, fresh	Tuna
Oysters, raw	Herring
Salmon, canned	
Nut meats	
Brazil nuts	Butternuts
Miscellaneous foods	
Broth	Ham
Cod liver oil	Lard
Cooking oil	Mineral or salad oil
Custard, no sugar	Soybean flour
Eggs	Cottonseed flour *

Avoid	
Vegetables	
Artichokes, Jerusalem	Corn
Lima beans	Potatoes
Parsnips	Succotash
Green peas	Beans, except soy
Chili sauce	Potato chips
Fruits	
Blackberries	Blueberries
Cranberries	Cherries
Gooseberries	Currants
Oranges	Grapes
Orange juice	Grape juice
Peaches	Huckleberries
Pears	Raspberries
Pineapple	Bananas
Apples	Plums
Apricots	Prunes
Dairy products	
Malted milk	
Cereals	
Cream of wheat®	Puffed rice
Corn flakes	Rice
Oats	Shredded wheat biscuits
Nut meats	
Almonds	Peanuts
Chestnuts	Peanut butter
Coconuts	Pecans
Filberts	Pistachio nuts
Hickory nuts	Walnuts, black, English
Miscellaneous foods	
Alcoholic beverages	Ice cream
Carbonated drinks	Macaroni
Chocolate	Spaghetti
Cocoa	Sugar, granulated
Ginger ale	Chewing gum
Honey	
Breads, cakes, pastries	
Bread	Cookies
Crackers	Pie
Cake	Pudding

* Flour available as Nutty-Brown® flour from Cedar Valley Mills, Cedar Valley, Texas.

Women during their cyclic steroid fluctuation at the different phases of the estrus cycle tend to present symptoms and signs of any imbalance. A premenstrual triad of fall in energy, crabbiness, and mental depression indicates estrogenic deficiency. A premenstrual period of increased tension, with sensitive breasts, indicates progesterone deficiency. The hypersensitive woman with a tendency to fatty padding, easy mental and physical bruising, constant complaints of pains in the back, neck, head, or "some place," and a premenstrual burst of energy (for example, meticulous cleaning of the house every month) is suffering from functional hyperinsulinism.[3] The dextrose tolerance curve will be particularly flattened during the premenstrual spurt-of-energy phase. A high-protein, very low-carbohydrate diet (Table) will correct the symptoms and lead to a gradual weight loss, even though as much is eaten as is desired of the "may have" diet list (including fats! unless otherwise contraindicated), provided rigid abstinence from the "avoid" list is maintained. Excess fat, if present, will be reduced. In some instances, there is at first very little actual weight change, although the patient's size decreases. This is explained by the fact that this diet instigates a positive nitrogen balance, and the fat loss is replaced by protein (muscle), which takes up less room per equivalent weight.

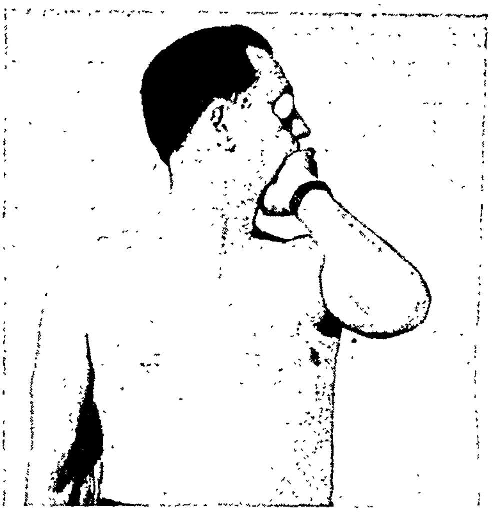

Fig. 1.—Forced craniocervical rotation.

USE OF MOBILIZATION TECHNIQUES

In the industrial field the biggest "headache" is the backache and its accompanying sensory-nerve peripheral pain and motor-nerve muscle spasm. The terms "railroad spine," "gold bricker," "neurotic," "compensationitis," "malingerer," and many others, have arisen to becloud the issue. Several diagnostic points have recently been recognized as showing that these backaches with their peripheral-nerve signs are of truly organic

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2. Hisaw, F. L.: Experimental Relaxation of the Pubic Ligament of the Guinea-Pig, Proc. Soc. Exper. Biol. & Med. 23: 661-663 (May) 1926.

3. Billig, H. E., Jr., and Spaulding, C. A., Jr.: Hyperinsulinism of Menses, Indust. Med. 16: 336-393 (July) 1947.

cause. 1. Frequently a restriction of motion of the spine in the region complained of, due to fibrous fascial ligamentous contracture, is found, accompanied with sensory pain and motor muscle spasm into the area of distribution of the peripheral nerves, the foramens of which are constricted where they pass through the constricted fascial ramifications. Careful history-taking frequently elicits the factor causing the contracture to be a strain while lifting, in which a few fascial fibers may be torn and the fibrous response to the insult is subsequent contracture. One hears many stories such as this: "I sprained my back yesterday, Doc, and seemed to get over it after a little while; but this morning, when I tried to get up, it was so stiff and sore, and the pain was so bad down my leg, that I had to roll out of bed." A generally unappreciated fact that is known to all concerned with peripheral-nerve surgery is that mechanical compression (e. g., squeezing with a hemostat) of a peripheral nerve causes a feeling of pain radiating into the peripheral distribution of its sensory nerve fibers, with muscle spasm in the peripheral distribution of its motor nerve fibers. If these "stiff" patients are tested by placing manipulative tension on the contracted fascial ligamentous bands, the foraminal nerve compression is additionally increased, and the peripheral-nerve signs of pain and muscle spasm are increased. 2. Electromyographic examination of the muscles reveals, in most cases, a multiple peripheral-nerve irritation and not a specific nerve-root irritation type of distribution pattern, indicating a peripheral-nerve irritative factor.

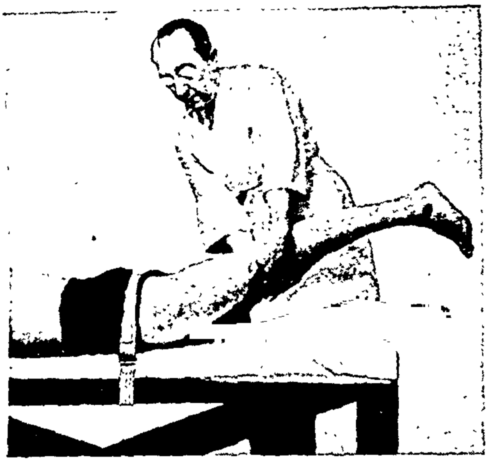

Fig. 2.—Exacerbation of symptoms by a pull on ligaments running from dorsolumbar portion of back to anterior pelvis and leg.

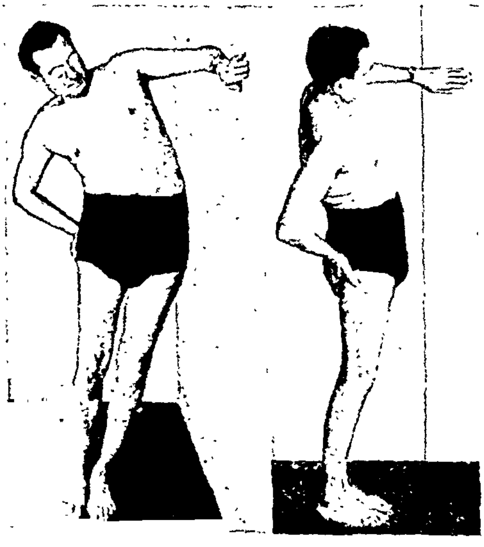

Fig. 3.—Loosening of contracture through forced posterior tilt of back and pelvis on the leg.

Chronic posture habit results in shortening of the fascial ligamentous fibrous structures to accommodate the posture maintained. When this is occupational, and when the occupational posture habit becomes the chronic posture habit, the gradually ensuing contractural stiffness results in not only a poor posture habit but symptoms [4] as well. The management of a telephone company noticed a huge prevalence of backache, dysmenorrhea, and occipitocervical headaches radiating to the temporal region among the thousands of girls seated with forward thrust of head and neck at switchboards. Examination revealed a contracture of the ligaments in the cervical region and in the lower back region, radiating to the anterior pelvis, thence to the leg and iliotibial-band attachment at the lateral condyle of the tibia. In these girls the forward thrust of head and neck and the forward-tilted pelvis had thus become a fixed posture habit. Placing an additional pull on the contracted ligaments in the neck by means of forced craniocervical rotation (Fig. 1) exacerbated the headache radiating up over the head into the peripheral distribution of the greater and lesser occipital nerves. After mobilization of this contracture by means of progressive accumulative loosening through forced cervical-rotation stretching exercises done routinely three times to each side three periods daily (Fig. 1), the headaches cleared up, not to return. Likewise, placing an additional pull on the ligaments running from the dorsolumbar portion of the back to the anterior pelvis, thence to the leg (Fig. 2), exacerbated the symptoms of backache and menstrual cramps (pain radiating into the peripheral distribution of the ilioinguinal and iliohypogastric nerves arising from the twelfth dorsal and first lumbar nerves passing through the contracted fascial ramifications). After mobilization

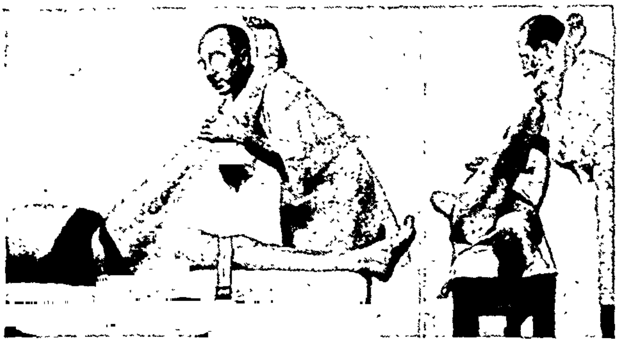

Fig. 4.—Exacerbation of symptoms through a pull on contracted ligaments, increasing compression stimulus to nerve.

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[4] Billig, H. E., Jr.: The Release of Fascial Ligamentous Contractures in Physical Rehabilitation, Indust. Med. 14: 270-273 (April) 1945.

of the contracture by means of the progressive accumulative loosening through forced posterior tilt of back and pelvis on the leg (Fig. 3) done routinely three times to each side three periods daily, the backache and menstrual cramps cleared up, not to return. These "stretching exercises" are now a part of the employee health service program of American Telephone and Telegraph Company and are illustrated by diagrams in a booklet distributed to all its employees. On the "work to win" program at Consolidated Vultee Aircraft Corporation during World War II, up to 40 days per hundred women per month were lost by absenteeism due to these complaints, in spite of a handsome bonus for the persons of each group each month, provided there was no off-duty among the group. During the first 10 months after instituting the mobilization-stretchings program (voluntary!) off-duty time was reduced to zero among these thousands of women.[5]

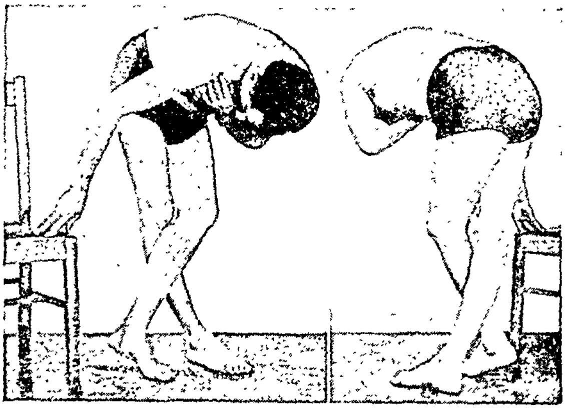

Fig. 5.—Correction of posteriorly tilted pelvis by means of stretching exercises.

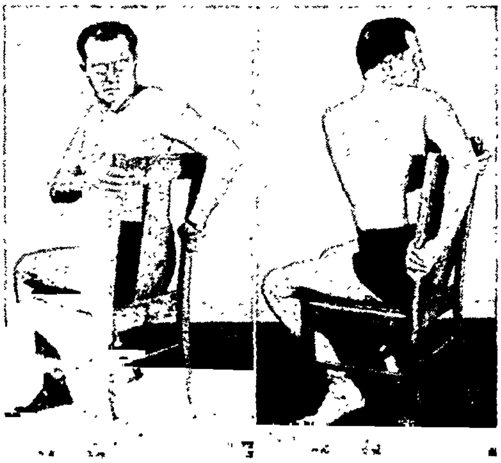

Fig. 6.—Forced trunk rotation.

In lathe workers it has been noticed that the assumption of a posteriorly tilted pelvis posture enables the employee to last out the day without tiring. Unfortunately, this leads to a chronic posture habit of posteriorly tilted pelvis, and hence flattening of the lumbar part of the spine. After a time the ligaments between the lower back and posterior pelvis, thence to the leg and iliotibial-band attachment at the lateral condyle of the tibia, contract, and the man can no longer execute a full forward bend. The contracture constricts the foramens through which pass the nerves making up the lumbosacral plexus and gives rise to complaints of backache and/or pain radiating into the peripheral distribution of the nerves so irritated. The nerves involved are commonly (1) various portions of the sciatic-nerve distribution as far as the peroneal or posterior tibial distribution in the foot[6] and (2) nerves radiating from the sacroiliac plexus through the hip anteriorly as a femoral-nerve distribution as far as the medial aspect of the knee and then "through the knee." Placing an additional pull on the contracted ligament (Fig. 4) causes increased compression stimulus to the nerve and exacerbates the symptoms complained of. Again, in this region, the fibrocytic contracture can be loosened by progressive accumulative mobilization by means of stretching exercises (Fig. 5) done routinely six times to each side three periods daily.

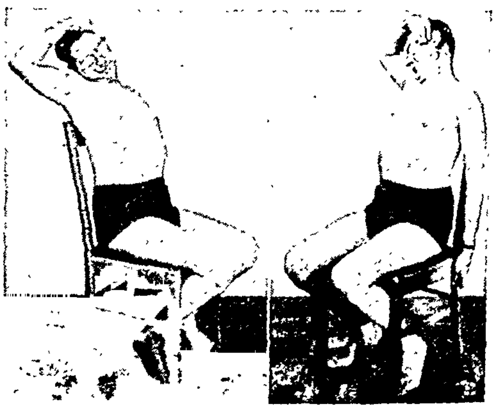

Fig. 7.—Mobilization stretching to relieve symptoms of intercostal neuritis.

In the dorsal area of the spine the complaint may be of a pain "between the shoulder blades," radiating to the anterior portion of the chest as an intercostal neuritis, and frequently felt only as an anterior chest pain. Testing is by means of a forced trunk rotation (Fig. 6). Treatment by mobilization stretchings (Fig. 7) done routinely three times to each side three times daily will bring relief.

Brachial-plexus irritations, giving rise to peripheral-nerve pains radiating out toward the shoulder and arm, can be exacerbated in testing by means of lateral tilt of the head and neck, keeping the chin well retracted and turned toward the direction of tilt (Fig. 7). Mobilization stretching is carried out by repeating the procedure routinely three times to each side three periods daily.

During the past few years these practical methods of combating the commonest complaints have been instituted in a number of industries and school systems.[7] It is always well to encourage the confidence of the employee, recognize and treat symptoms early, keep him on duty if possible, and see him frequently in order to keep up the morale until such time as he has progressively loosened the ligaments and mobilized sufficiently to begin to obtain relief.

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[5] Dick, A. C.; Billig, H. E., Jr., and Macy, H. N.: Menstrual Exercises: Absenteeism Decrease and Work Efficiency Increase, Indust. Med. 12: 588-590 (Sept.) 1943.

[6] Billig, H. E., Jr., and Brennan, R. L.: Foot Pains, Mil. Surgeon 92: 539-542 (May) 1943.

[7] Wheeler, I.: The Billig Exercise, The Foil, Official Publication of Delta Psi Kappa, December, 1943.

It may, in severe cases, be necessary to give passive assistive mobilization stretchings[8] if the patient is not able to do them hard enough by himself to accomplish a progressive loosening.

In a major oil-tool manufacturing company backaches and sciatica were so prevalent that it was decided to institute a plant program of immediate mobilization stretchings in all cases in order to prevent contracture after back strains, and in order to mobilize whatever contracture was already present. A technician was trained at the Billig Clinic and then placed on duty at the plant to carry out the program immediately after the doctor's examination, the employee staying on duty. For several years following the start of this program, there was no lost time from these complaints, other than that necessary for the doctor's examinations. Recent check reveals that in that plant all the foremen have now been trained to recognize even mild complaints in the men of their group and to report them immediately to the medical office, so that mobilization treatment can be started before contracture has become severe.

SUMMARY

It is pointed out that increased medical knowledge, changing industrial employee-employer relations, and the trend to total industrial and nonindustrial care have had great influence on developing the important field of industrial medicine.

The importance of fibrous (collagenous) tissue contractures and their relation to production of the common industrial complaints of backache and peripheral-nerve pain, with ensuing loss of time, employee disability, and impaired work efficiency, are discussed.

Metabolic changes based on abnormalities of steroid endocrine balance producing many of the orthopedic complaints in industrial practice are briefly outlined.

Therapy by use of readily available steroid endocrine preparations is presented.

Mobilization techniques by means of progressive accumulative fascial ligamentous stretching to correct fibrous-tissue contractures and relieve backache and peripheral-nerve pain are briefly summarized.

536 S. Hill St.

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[8] Billig, H. E., Jr., and Loewendahl, E.: Mobilization of the Human Body, ed. 1, Stanford, Calif., Stanford University Press, 1949.

THE SPECIALIST LOOKS AT EVERYDAY MEDICAL CARE IN INDUSTRY: PSYCHIATRY

Floyd O. Due, M.D., Oakland, Calif.

The psychiatric field has a large role to play in the department of industrial medicine. It cannot be overemphasized that many lost hours in terms of manpower could be saved by the consideration that employees are persons who react to even subtle stresses and tensions in the industrial facility as a whole, and that each employee brings to work the tensions of his own family relationship, as well as those from his own general social milieu. It has long been accepted that absenteeism, work slowdowns, and accident-proneness are influenced by such emotional tensions. The plant physician occupies a unique position between management and the worker. The position of the doctor in our culture allows for special confidence from the worker, even though the worker may consider that the doctor represents management. The doctor's attitudes can, therefore, be very influential with the worker, and if the doctor is to function to the best interest of the plant his attitudes should also be influential with the management. Thus, he can arbitrate many potential grievances that might lead to emotional tensions and breakdowns.

PSYCHIATRIC ORIENTATION

It is obvious that only the largest of industrial facilities can have a psychiatric specialist as part of the plant medical team. It then devolves on the full- or part-time physician and the members of the nursing staff to acquire a psychiatric orientation in which evidences of emotional tensions can be recognized. Although everyday treatment in the psychiatric field will not seem as concrete as the local treatment of minor injuries and illnesses, it can be seen that an awareness of emotional problems can lead to therapeutic actions that are concrete and valuable to the industrial facility.

It is unlikely that the plant medical staff will frequently be faced with extreme psychiatric emergencies requiring immediate attention. The chief emphasis, therefore, must be placed on prevention of disability from emotional disturbances and psychiatric illnesses that could arise from complications in the worker's industrial and personal life. Such an emphasis presumes that the medical staff be able to serve the whole industrial plant from the standpoint of elimination of job tensions, employer-employee relations, personnel placement with attention to consequent job satisfactions and dissatisfactions, counsel in instances of overt tension, and referrals to psychiatrists and psychiatric clinics when indicated.

Perhaps the greatest step toward the development of a psychiatric orientation in the medical staff is the cultivation of an alert awareness of the emotional attitudes and tensions in the everyday lives of the workers to whom care is administered. The physicians and the nurses of the staff should be encouraged to study psychiatric texts and articles in which this orientation is elaborated. They should be willing and able to listen to the patient with an ear toward the patient's emotional state as well as toward his physical state. In dealing with the patient, they should avoid a disciplinary, judgmental, and critical attitude. They should be able to produce in the patient the feeling that they are friendly and im-

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Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 28, 1950.

partial confidants who will at all times try to see the patient's side of the story. A failure in this relationship between the medical staff member and the worker will lead to the withholding of information that might be more important in the long run than the minor injuries or illness that presumably brought the patient to the medical department. The medical staff members should have enough authority to make recommendations regarding manipulation of the patient in his industrial setup.

FUNCTIONS OF MEDICAL STAFF

By far the most important part of the staff's function involves careful history taking with the permissive attitude previously suggested. While eliciting the history, there should always be an awareness of the emotional potentiality behind the complaints that are presented. Even if the patient's complaints do not seem valid or concrete, the interviewer should consider that every complaint represents some real problem for the complainant. It is, therefore, the physician's task to try to diagnose the latent problem, even though it might not turn out to be a specific problem of organic medicine. In utilizing this attitude, great care should be taken not to give the employee the impression that the awareness of emotional problems on the part of the medical staff members means that every patient is considered to be a potential "goldbricker." Such an attitude on the part of the medical personnel soon becomes well known by all the employees in the plant, and proper rapport for elaboration of emotional problems is, therefore, lost by all but a few employees. Eadie [1] called this phase of the history taking the search for the "latent complaint." He emphasized that all the following measures should be taken by the physician in tracing down such latent factors in the patient's complaints. He stated that the patient's story should be checked against physical findings; that the previous history should be correlated for facts that tie in with actual physical disease or with neurosis; that the nurse's observations of the patient should be checked; that the supervisor's observations should be checked, and that in some instances the physician should go into the shop personally and check the man's job and group situation. He also emphasized that the patient's home situation should at least be inquired into and that the response, or the lack of response, to treatment should be carefully observed and recorded. These measures would certainly represent the extent to which a medical team with psychiatric orientation could follow the rule that "every complaint represents some real problem for the complainant."

Careful records should be made of these historical investigations of the medical department. These records should be kept in close conjunction with the progressive records of the physical examinations and periodic health checks. Results of all special examinations and consultations should be a part of this record. The number of days of sickness and absenteeism should be correlated. It is extremely important that even minor accidents be recorded, along with the examiner's impression of the emotional attitudes of the injured patient. The patient's manner of relating his history and complaints, an evaluation of his facial expressions, and the amount of pressure apparent in his general speech and attitudes, should all be recorded as possible signs of emotional factors in the presenting complaints. Such carefully kept historical and medical records will pay large dividends on later investigations into the fields of potential psychiatric or emotional breakdowns. For instance, a succession of minor injuries might lead to the suspicion of an eventual depressive illness or perhaps even of a potential psychotic breakdown.

RECOGNITION OF POTENTIAL BREAKDOWNS

Some of the "signals" that might indicate potential breakdowns can be summarized: for instance, the restlessness, irritability, hyperactivity, and emotional instability of the hypomanic person, or the opposite trends, such as psychomotor retardation and the pessimistic and self-accusatory attitudes of the worker with potential depression. Preparanoid breaks may be signaled by increased complaintiveness against supervisors and fellow employees, as well as by more general ideas of reference and tendencies toward ideas of persecution. Preschizophrenic signals might involve withdrawal, flattening of emotional response, apparent preoccupation, automatic mannerisms, and strange or eccentric behavior. Neurotic and psychosomatic disabilities may be heralded by increased frequency of visits to the medical facility with physical complaints out of keeping with organic findings. In these persons physiologic evidences of anxiety and tension, along with the recording of the degree of insomnia, would be important.

Treatment that can be given by the industrial medical team short of referral to a specialist in psychiatry may include the process of catharsis, in which the physician or nurse is a permissive listener to the complaints and problems of the employee. Often such catharsis can afford sufficient release of tension to allow the patient to manage his own problem. Furthermore, it is possible that from the employee's release of personal feelings the physician or nurse can isolate some factors relative to which recommendations, reassurances, and suggestions can be given. Manipulation of the environment can also be accomplished, perhaps by correction of certain discomforts in the work situation, by arbitration of irritating occurrences among co-workers and between employees and supervisors, and by discussions with the foreman or executive in an attempt to eliminate the sources of tension. The physician also can make suggestions regarding the disturbances in the home situation, as, for instance, recommending that the worker's spouse go to a doctor or psychiatrist.

Sometimes the symptoms themselves afford clues to the exciting agent of the disturbance. For instance, recurrent headaches often are indicative of underlying resentment and hostility that cannot be expressed overtly. This resentment might be a part of the worker's family situation, but it can also be a result of his relations with other employees or his supervisors. For instance, the apparently unjustified promotion of a younger and newer worker might produce such a situation. Upper gastrointestinal complaints often are indications that the worker's sense of dependent security is threatened. Questions can be directed toward elaboration of this factor in both the home and the work situations. Diarrhea and colitis symptoms often occur in a setting where the victim has an excessive need to please his superiors, thereby sacrificing his own individuality. Symptoms referable to the opposite mode of lower bowel function, that of retention, i. e., constipation and its complications, often occur in those who have a great sense of being exploited by the work situation and who are on the defensive against such exploitation. Symptoms referable to the back often occur in workers who, on the one hand, have a strong sense of responsibility and, on the other, have an overwhelming feeling of inferiority in the face of responsibility. The above are all generalities that might aid in tracing down emotional sources of physical symptoms.

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[1] Eadie, G. T.: Practical Methods for Handling Psychosomatic Problems in Industry, Indust. Med. 18: 369-371 (Sept.) 1949.

REFERRALS

If there is an apparent, serious psychiatric condition that cannot be managed by the medical staff, then the worker should be referred to a psychiatrist or to a mental health clinic. The patient should be carefully prepared for this referral from the beginning in order to prevent a hostile attitude that might make his visit to the psychiatrist unfruitful. Some general explanation of the mechanisms by which emotional problems can produce physical symptoms might reassure the patient that such a specific referral does not indicate that the medical staff considers that the worker is approaching some serious mental breakdown or insanity. In general, the patient should always be told that he is going to a psychiatrist rather than to a nerve specialist or neurologist. Such attempts to attenuate the situation usually lead to a handicap in the psychiatrist's relations with the patient for either diagnostic or therapeutic purposes. In cases of probable psychotic complications, it is well also to inform a responsible member of the patient's family of the situation and to have that person accompany the patient to the psychiatrist's office. This is important because the relative can give objective and factual information that the psychotic patient may not be able to verbalize, and he also can be responsible for initiating hospital and sanitarium care if necessary. It is well to prepare the psychiatrist with some general estimate of the patient's problem and to furnish him with a summary of the employee's previous work and health record.

SPECIAL PSYCHIATRIC PROBLEMS

It is considered that some attention should be given to special psychiatric problems that might confront the general medical staff at the plant. Chronic and recurrent acute alcoholism is one of the most important of these. The incidence of chronic alcoholism in the United States is high and seems to be increasing. Obviously, this disorder takes a great toll from industry from the standpoint of inefficiency on the job, absenteeism, and actual loss of and disability in workers who have been the recipients of a long and expensive training program. The last effect is particularly felt in the case of the "secondary" alcoholic who acquires the condition gradually after a relatively well-adjusted early life. Some of these persons can be helped by psychiatric treatment, if the condition is recognized and if they can be convinced that they should seek psychiatric help.

A special problem that engenders actual financial loss to the company directly, as well as indirectly through impaired morale of the co-workers, is the condition known as accident-proneness. Many investigators in the field have found that accidents are more likely to occur in a certain group of persons. In fact, nearly all the accidents in a plant might be attributed to a relatively small percentage of the personnel. Csillag and Hedri, in 1949,[2] delineated some of the factors in the history and examination of the persons in this small percentage. They stated that 54% of the patients in this group had lost one of their parents in childhood or did not even know their father or mother. Almost one-third of the accident-prone patients' deceased fathers had been the victims of violent death. There is a suggestion that accident-proneness in this series represented identification with the violent death of the father. Seventy per cent of the accident-prone patients could not give free expression to aggression. Several had tried to do this indirectly by choice of vocation or by their indulgence in certain sports; but where such efforts proved insufficient, and, where the moral standards were at a relatively high level, the patient tended to choose the accident solution to the problem. Thus, the patient turned his aggression against himself in the form of recurring accidents. These investigators also found that purposeful accidents could have as a motive the prevention of loved ones from leaving the victim. Accidents also occurred among competitors who were reckless with their own physical welfare in order to achieve more than others. These accident-prone persons can be isolated by history and by the record of minor injuries and, perhaps, given specific treatment to produce some insight into these morbid areas of their personality structure.

Another important special problem is that of industrial accidents in which a battle for compensation becomes an important factor. I have had occasion to examine many of these cases in which prolonged medical, orthopedic, and surgical measures had no therapeutic success. Psychiatric examination and history revealed that at the time of the accident nearly all these patients had some grievance that was not recognized on the original treatment of the injury. The administration of these cases aggravated, rather than minimized, the grievance. For instance, the practice of transfer of the responsibility for injured workers to a relatively unknown insurance company left the patients without any friendly person in authority to be the guiding and integrating factor in their treatment. Rather, the patients were sent to various doctors for consultations, and occasionally their conditions were given diagnoses that did not hold up under subsequent investigations. The patients' need for a concrete physical justification for their disability led to fixations on the area of mistaken diagnosis. It also led to resentments against those doctors who later did not agree with the previous mistaken diagnosis. As a result of being bandied about, the patients developed confusion and resentment that built up the original grievance to almost insurmountable heights. By the time these patients reached a psychiatrist, it was impossible to resolve the complicated superstructure of grievances and countergrievances without complete settlement of the case by cash payment. The cash payment represented at least some reward for the original grievance and for the subsequent grievances that piled up in the course of the patients' circuitous journeys through hospitals, doctors' offices, and courts. It must be honestly admitted that these patients occasionally suffered real indignities at the hands of some physicians who are poorly oriented in terms of a human approach to the patient. I have been placed on record, in testimony to a court, that poor management of this type in itself represents a source of injury to the patient and that it is, therefore, compensable. This stand was recognized as valid by the court in one outstanding case. I have come to the conclusion that many of the compensation cases that terminate in court battles have come to this end through continued episodes of mismanagement. I believe that a careful investigation of the emotional factors at the time the injury was sustained, along with sympathetic and understanding management early in the condition, would have forestalled many of these eventually expensive court proceedings.

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[2] Csillag, and Hedri, E., Jr.: Personal Factors of Accident Proneness, Indust. Med. 18: 29-30 (Jan.) 1949.

Psychotherapy is extremely difficult after a case of this type has been complicated to the degree described above. By the time the patient sees a psychiatrist, his whole emotional set is to prove and maintain his illness at all cost, inasmuch as the relief of pain through psychiatric means would be tantamount to admitting that he was "faking" all along. It is also difficult to accomplish successful psychotherapy in a situation in which the court has granted a disability pension and has instructed the insurance company to pay for psychiatric treatment of the patient in question. My experience supports the views of others who have stated that an outright cash settlement, with the removal of the case from further court action, is the only measure that can release the patient from his need to maintain a stubborn stand against those whom he now feels have injured him in a variety of ways. In conclusion, I recommend that a closer liaison be kept by the plant physician or his representative with those patients whose treatment has somehow progressed into the hands of the insurance company and its doctors. Such a representative can obviously be closer to the employee and can be helpful in interpreting to the injured worker the significance of the various treatments and opinions that have been rendered.

THE SPECIALIST LOOKS AT EVERYDAY MEDICAL CARE IN INDUSTRY: CARDIOLOGY

B. M. Overholt, M.D., Knoxville, Tenn.

Interest in the subject of everyday medical care in industry from the standpoint of cardiology was accelerated by experiences during World War II, when it was necessary to employ manpower from the 4-F category. This increased the incidence in industry of hypertension, arteriosclerosis, rheumatic heart disease, psychosomatic disorders, and other cardiac defects. To a great extent experiences with these groups proved that persons who had cardiac disorders with a limited disability could carry on very well in industry.

Now that manpower is more plentiful, the limited cardiac cripple is again coming up against the barrier that has so long stood in his way, namely, the attitude of the employer that more or less insists that an employee be on a full-duty status, using Army terminology, and that there is very little place for an employee who can do limited duty only. Correction of this fallacy rests on education of management and union leaders, showing them statistically that the cardiac with a limited disability can be as productive as any other person, provided there is proper selective job placement.

A few statistical studies present evidence that persons with cardiac conditions are a good employable risk. Dr. Howard Rusk,[1] in a recent report, cited the latest of these studies which was made by the Bureau of Labor Statistics for the Veterans Administration. This study compared 1,800 workers having cardiac impairments with 3,000 unimpaired fellow workers on the same jobs. Although the persons with cardiac disease were slightly higher in absenteeism, disabling work injuries, and voluntary quit rates, differences were so slight that they were not considered significant. For example, the cardiac workers averaged two and one-half days a year more absenteeism than their unimpaired fellow workers but more than compensated for the time lost by their increased efficiency and stability.

The second problem in the management of the industrial cardiac worker resolves itself in the treatment and observation of those employees who have been working in the same plant for years and who acquire cardiac disorders. The problem here involves more frequent periodic check-ups and reclassification of the employees to positions compatible with their cardiac defects. This runs into certain complexities, such as labor-union rules regarding seniority rights and job transfers. There are also legal factors that involve aggravation of existing cardiac defects in the worker or danger to his fellow workers or to his company; for example, the railroad engineer in whom coronary artery disease develops. Certainly we must realize that with the increase in the span of life the problem of geriatrics in industry must assume a more important role; the need for continued employment of older workers is obvious. Their skill and reliability should be utilized.

From the Acuff Clinic.

Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 28, 1950.

This paper and the two previous papers were presented as part of a symposium.

[1] Cited by Sprague, H. B.: Employment of Cardiacs, Indust. Med. 17: 279-282 (Aug.) 1948.

The next question that I should like to take up is the consideration of the placement of the cardiac worker in industry in reference to his disability. It is essential, when a new employee with a cardiac defect presents himself for job placement, or when the old employee comes in for reclassification because of an acquired cardiac defect, that he is classified from an etiological, functional, and therapeutic standpoint. The criteria for these various classifications have been outlined by the American Heart Association. Such classifications uniformly used will eventually bring about a large series of statistics in industry that will act as a guide for the industrial physician.

HYPERTENSION

Hypertension is a common occurrence in industry, if we accept as a measure of normal blood pressure a systolic reading of less than 150 mm.Hg and a diastolic reading of under 90. A few attempts have been made to evaluate how long a hypertensive person may work, but no critical approach to the problem has been made, the reason being that there are so many variables associated with the evaluation of hypertension itself. Smith and Lambie, in reporting their experiences over a period of 10 years, were of the opinion "that the hypertensives had as short a period of disability before death as did the average worker, and their degree of usefulness as employees continued good up until their severance from work." Sprague felt that hypertensive disease coming on in the fifth decade may allow 10 or more years of normal existence. Eventually the hypertensive person exhibits one of the complications of the disorder, and then he is a serious risk. For this reason, my policy has been to have more frequent periodic check-ups on hypertensive workers than on nonhypertensive workers. In a survey of 342 employees, followed for a period of years, it was found that the percentage of abnormal electrocardiograms was in direct proportion to obesity and hypertension. I should like to cite two instances of hypertension in this group of employees that have been interesting to me and demonstrate difficulties in prognosis and management.

Case 1.—A white man 48 yr. old, 5 ft. 10 in. (178 cm.) tall, weighing 181 lb. (82 kg.), had persistent diastolic pressure of 128, with a record of diastolic pressure as high as 170 on one occasion. He was known to have had severe hypertension of at least 10 years' duration. Electrocardiograms that were taken routinely at yearly intervals for four years were essentially the same. The roentgenographic configuration of the heart revealed no change during these years. This man was able to work with no disability and no loss of time from 1945 through 1949. This case is presented to demonstrate that this worker with a high diastolic pressure was able to work for a relatively long period.

Case 2.—A 60-yr.-old white man, 5 ft. 11 in. (180 cm.) tall, weighing 145 lb. (66 kg.), had persistent diastolic pressure of 118 and above for at least three years. How long before this he had had hypertension was undetermined because he had sought the advice of no physician. Roentgenographic examination of the heart for size revealed a minimal cardiac enlargement confined mainly to the left ventricle. Results of routine laboratory procedures were all within normal limits; electrocardiograms were normal in 1947. However, in 1948 there was considerable change in the configuration of the QRST-complexes, which was the first indication that the employee was having cardiovascular difficulties. This man was feeling absolutely well and had lost no time from work; clinically there had been no change in his cardiac status. This particular case represents the value of repeated serial examinations and serial electrocardiograms.

ARTERIOSCLEROSIS

Arteriosclerotic heart disease, including anginal syndrome and myocardial infarction, is a problem of increasing significance and will continue to be so as long as we are dealing with an older age group. Placement of employees who have had myocardial infarction is difficult. Too frequently the employee has been trained in hard manual labor, and the occurrence of a myocardial infarction precludes continuance in that type of work. The difficulties of transfer to another position in view of seniority rights and the difficulties entailed in teaching older employees new responsibilities are other factors. In the few instances in which the employee is fortunate enough to be on a job calling for minimal physical and mental exertion, he does very well for long periods. The employment of new applicants who have suffered myocardial infarction must of necessity be confined to a small and well-selected group. The problem of continued employment of the person with myocardial insufficiency on the basis of coronary artery disease with anginal syndrome is one of careful selective job placement and follow-up observation. The diagnosis at times presents difficulty because of lack of objective evidence, particularly in the case of employees who are attempting to hide physical disabilities and who give an unreliable history for various reasons.

I frequently see men seeking employment who deny any trouble and yet who, after careful study, present pictures such as this. Some authors have recommended that all employees, such as firemen and engineers, who have responsible positions involving the lives of other persons have a routine electrocardiogram made before and after exertion.

RHEUMATIC FEVER

Absenteeism due to recurrences of rheumatic fever and respiratory tract infections frequently precludes the employee from continued work. Of prime importance in this particular group of workers is avoidance of exposure and extremes of temperature. Positions in sheltered locations where work can be done inside in a warm, dry type of environment are to be encouraged. In such circumstances, particularly where there can be freedom from excessive streptococcic infections, this group can do very well. I have had no experience with the prevention of recurrences of rheumatic fever with administration of sulfonamide compounds or pencillin in industrial plants. Psychosomatic cardiac disturbances and cardiac arrhythmias occur frequently and require adjustment, frequent consultation with psychiatrists, and reassurance, along with proper medicinal treatment. Some of the difficulties in the management of cardiac employees in industry are not always due to organic disease but are related to anxiety states arising from conflicts.

In summary, I should like to stress the need for further critical statistical studies of persons with cardiac disorders in industry. My second point is that the cardiac worker with a mild disability is a good employable risk, and my last, that provisions for continued employment of persons of the older age group be seriously considered.

OCCUPATIONAL TUBERCULOSIS IN HOSPITAL AND SANATORIUM PERSONNEL

William G. Childress, M.D., Valhalla, N. Y.

It is a well recognized fact that tuberculosis is not a respecter of persons in any walk of life. It may attack a person of any race or occupation any time from birth until death. There are racial, occupational and environmental differences of susceptibility, tissue reaction and resistance, involving basic and complicated formulas in biometrics, which are as yet only partly understood. We recognize racial susceptibility and resistance, yet who knows what variations, if any, would exist if all races had lived for centuries under identical conditions? Influences not wholly understood are exerted in age and sex groups. The virulence of the organism and the size of the infecting dose necessary to cause disease are also significant factors. All agree that without the presence of the tubercle bacillus in the working environment or the body, tuberculosis cannot develop as an occupational hazard. Conditions of employment may conceivably cause activation of a latent tuberculosis infection, but they are difficult to evaluate under normal conditions of employment. Therefore, in attempting to evaluate tuberculosis as an occupational hazard, one must keep in mind the above-mentioned factors and other basic considerations too numerous to discuss here, but the first line of attack must be against the tubercle bacillus in areas of employment.

CONDITIONS OF EXPOSURE

Perhaps there is no more incriminating evidence of causal relationship in the thinking of the public, and most physicians, than the development of the disease in a person known to have been exposed to it in a hospital or sanatorium. Yet, this is not prima facie evidence of causal relationship. There may be, and sometimes are, other opportunities for infection. Moreover, where rigid protective techniques are practiced, the danger may be greatly reduced or eliminated. Conversely, there is not prima facie evidence sufficient to exclude causal relationship when the disease develops in an employee who is in contact with unrecognized tuberculosis among patients or personnel, for when tuberculosis is unrecognized it is impossible properly to segregate patients and institute protective measures. How, then, may we proceed in an attempt to arrive at a reasonably accurate answer in fairness to all concerned? There is no better place than a well administered hospital in which to work out acceptable standards for fairly evaluating causal relationship in tuberculosis developing among hospital personnel. There are conditions of employment that point accusingly to causal relationship, others that defy exclusion of the possibility and those that may not preclude theoretical possibilities but make them appear unlikely.

TYPES OF CLAIMS

In our experience claims allowed or disallowed fall into four general groups. In the first, a young person, for instance a student nurse who enters employment with a family history negative for tuberculosis, negative tuberculin reaction and normal chest x-ray, is intensively exposed in the routine of duty for a few weeks or months. Her tuberculin reaction becomes positive, and eventually a tuberculous lesion develops. Since there are no other known sources of contact, she is reasonably considered to have acquired disease as a result of occupational exposure. All claims in this group have been allowed in our experience. In this same group is the person who has a family history of tuberculosis, but who has a negative tuberculin reaction and normal chest x-ray at the time of employment and in whom disease subsequently develops under the conditions described above. This person may also be considered to have acquired disease as a result of occupational exposure. It may be assumed that, even if there were a previous infection, it had cleared spontaneously and superinfection developed for all intents and purposes in completely healthy tissue, even if chest x-rays taken during employment revealed evidence of healed primary infection. In our experience, claims in this group have been allowed.

In the second group a person enters employment with a positive tuberculin reaction and a normal chest x-ray or evidence of healed primary infection only, without massive parenchymal involvement. If disease subsequently develops, this person may, and often does, become a subject of medical controversy. Exogenous superinfection or reinfection or endogenous exacerbation cannot be determined clinically, and contemporary pathologists,[1] agree that exogenous superinfection or reinfection may occur, and there is no constant pattern that distinguishes primary from reinfection tuberculosis clinically or pathologically. It must, then, be presumed that exogenous superinfection or reinfection is possible in any case, if indeed not probable. In our experience all such claims have been allowed when other contact or adverse working conditions could not be demonstrated.

A person in the third group enters employment with or without a history of tuberculosis or contact, has a positive tuberculin reaction and x-ray evidence of apparently healed or latent parenchymal disease. If the disease subsequently becomes active, this person is usually presumed to have reactivated disease or endogenous reinfection, despite other possibilities, because this type of tuberculosis is prone to reactivate under normal conditions of life independent of occupation. Only one claim has been allowed in this category in our experience.

The fourth group is largely made up of persons making false or questionable claims in an attempt to collect benefits to which they are not entitled. They gain employment by misrepresenting the status of their disease or by the employer's unawareness of the disease. They are usually represented by counsel. None of these claims has been settled in favor of the claimant in our experience.

From the Division of Tuberculosis and Chest Diseases, Grasslands Hospital.

Presented at the Thirty-Sixth Annual Convention of the International Association of Industrial Accident Boards and Commissioners, Milwaukee, Wis., Sept. 25, 1950.

[1] Opie, E. L.; McPhedran, F. M., and Putnam, P.: Am. J. Hyg. **23**: 530 (May) 1936. Pinner, M.: Pulmonary Tuberculosis in the Adult, Springfield, Ill., Charles C Thomas, Publisher, 1945, p. 173. Rich, A. R.: The Pathogenesis of Tuberculosis, Springfield, Ill., Charles C Thomas, Publisher, 1944. Terplan, K. L.: Am. Rev. Tuberc. (Supp.) **42**: 1 (Aug.) 1940. Medlar, E. M.: Am. Rev. Tuberc. **55**: 517 (June) 1947. Lurie, M. B.: Am. Rev. Tuberc. (Supp.) **44**: 1 (Sept.) 1941.

In the first two groups, time is an important factor, since detection of clinical disease may not immediately follow the infection it results from. In most instances claims allowed were those of persons in whom clinical disease had developed within a year after exposure or conversion of the tuberculin reaction. Awards in compensation claims are not made on clear scientific proof, which is almost always lacking, but on what appears to be the most likely proof in light of the evidence produced.

Attempts to evaluate fairly employees under consideration for workmen's compensation claims at Grasslands and experience in giving medical testimony in compensation court lead one to the conclusion that there are justifiable differences of opinion in any given case for reasons that have been mentioned. As long as honesty of conviction prevails, there is no place for intolerance of another's point of view. Yet, there is reason to believe that professional bias prevails at times. Justice in some instances will have to await further advances in the basic sciences and the institution of sound administrative practices. In the meantime, we should proceed along logical and proved lines of attack in an effort to reasonably establish or exclude causal relationship for employees in whom tuberculosis develops in the line of duty.

RECOGNITION AND ACCEPTANCE OF HAZARD

The medical profession and hospital administrators have been slow to recognize and accept the existence of tuberculosis as an occupational hazard, and few hospitals avail themselves of the full opportunity for case finding among hospital patients and employees. Fortunately, attitudes and practices are changing for the better. There is an increase in the use of acceptable methods of case finding in hospitals, and now 23 states, Alaska, Hawaii, the District of Columbia and the United States Government (for civil employees) have full coverage for tuberculosis as an occupational disease, and 18 states have limited coverage, principally for employees in institutions. I am informed by the director of the Division of Labor Standards, U. S. Department of Labor, that the lack of general coverage or of specific mention does not necessarily mean that a hospital worker contracting tuberculosis would not receive workmen's compensation, because there have been sporadic court decisions that the infection is an "accident."[2] In some instances there is the limitation that the disease, to be compensable, must be characteristic of the employment.

Mr. G. M. Ingersoll, acting chief of the Legislation Branch, Department of Labour, Canada, informs me that two provinces, British Columbia, in 1943, and Ontario, in 1950, added tuberculosis by statutory regulation to their schedules of industrial diseases for which workmen's compensation is payable, and at the 1950 session of the legislature, Manitoba amended its definition of industrial disease to include any other diseases (in addition to those listed in the schedule to the act) peculiar to, or characteristic of, a particular industrial process, trade or occupation.[3] This definition could, therefore, include tuberculosis.

GRASSLANDS HOSPITAL EXPERIENCE

In 1932 when the new tuberculosis program was begun, we started preemployment and periodic chest x-ray examination of all employees in the tuberculosis division of Grasslands Hospital.[4] Tuberculin testing was optional at that time but was made compulsory in 1941 as an aid in evaluation of compensation claims of persons in whom clinical disease had developed. In 1938 periodic chest x-ray examination was instituted for employees throughout the hospital, and, since Jan. 1941, chest x-rays have been obtained on patients admitted to the hospital for conditions other than tuberculosis.[5] Tuberculin testing as indicated and chest x-rays are done at six month intervals on professional groups in the hospital, including student nurses.[6] When closer observation is indicated, employees are followed in the chest clinic. Chest x-rays are made at yearly intervals on nonprofessional employees not in close contact with patients.

RESULTS

Early observations revealed a significantly higher incidence of tuberculosis among those working in close contact with known sources of infection than among those who were not, regardless of age or other considerations. This has been confirmed by later observations. Continuous case finding as outlined and follow-up of patients have resulted in the accumulation of valuable data. Since 1932, among 7,901 persons, 78 without previous evidence of significant tuberculosis, many without evidence of infection, were found to have active tuberculosis during employment and while under observation. Sixty-five of these cases developed in a group of 3,486 employees with 9,750 exposure years, a rate of 0.66 per 100 per year, and 13 developed in a group of 4,415 without known exposure, a rate of 0.13 per 100 per year. It is significant that among the 78 patients in whom clinical disease developed there were 13 physicians, 27 student nurses, 20 graduate nurses and five attendants, revealing that a greater danger exists for those in close contact with the patient. The annual attack rate in this series for professional groups is approximately 1 per 100, which is higher than the rate of 0.66 per 100 for all employees with known exposure. Somewhat higher or lower annual attack rates have been reported in nursing and hospital groups by others.[7] All are higher than the annual attack rate of 0.2 to 0.3 for clerical employees in the Metropolitan Life Insurance Company, reported by Reid,[8] and than our unexposed group, in which the rate is 0.13.

DISCUSSION

With the recognition of tuberculosis as an occupational hazard by so many governmental agencies in the United States, Canada, and the territories, it becomes increasingly important to recognize forces that contribute to the hazard. As stated in the introduction, there are many influencing factors that need clarification. It does appear that a major contributing cause is the opportunity for intensive exposure to the tubercle bacillus. However, the danger of exposure should not be overly stressed, because most (98.2 per cent) of those working in close contact during the period did not develop disease, indicating a high degree of native resistance.

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[2] Connolly, W. L.: Personal communication to the author.

[3] Ingersoll, G. M.: Personal communication to the author.

[4] Childress, W. G.: Am. Rev. Tuberc. 49:6 (June) 1944.

[5] Childress, W. G.; Debbie, A. G., and Harmon, E. L.: Tuberculosis Case Finding by General Hospitals, J. A. M. A. 122:1063 (Aug. 14) 1943.

[6] Childress, W. G.: New York State J. Med. 47:23 (Dec.) 1947.

[7] Amberson, J. B., and Riggins, H. M.: Ann. Int. Med. 10:156 (Aug.) 1936. Riggins, H. M., and Amberson, J. B.: Ann. Int. Med. 10: 156, 1936. Beckerman, J. M.: Personal communication, cited by Muschenheim, C.; Bunn, P. A., and Lansdown, F. S.: Ann. Int. Med. 24:968 (June) 1946. Lim-Yuen, D. M.: Am. Rev. Tuberc. 54:261 (Sept.) 1946. Muschenheim, C.; Bunn, P. A., and Lansdown, F. S.: Ann. Int. Med. 24:968 (June) 1946. Badger, T. L., and Ayvazian, L. F.: Am. Rev. Tuberc. 60:305 (Sept.) 1949.

[8] Reid, A. C.: J. Indust. Hyg. & Toxicol. 22:408 (Nov.) 1940.

In reporting on accident hazards and costs in service industries, Donlon [9] reports that of 116 cases of occupational tuberculosis in 1947 for all service activities, 109 occurred in hospitals and other health services where exposure is greatest. In our series, from 1935 through 1948, 46 claims for workmen's compensation were allowed on the basis of causal relationship, and 13 were disallowed. Our experience amply supports the view that occupational tuberculosis develops where there is a chance for intensive exposure. All 46 who were awarded workmen's compensation worked in heavily exposed areas where causal relationship could not be excluded. The tuberculin reaction was positive in 19, negative in 20 and unknown in seven at the time of employment, which shows that the presence or absence of a previous infection has not materially influenced the decision of the courts in the evaluation of these claims.

Occupational tuberculosis results in unnecessary suffering and loss of life, for, despite a good end result for 75 per cent, 25 per cent have died or are still incapacitated from active tuberculosis, in our series of 78. In addition, the expense involved is excessive in loss of time and cost of treatment and compensation. Therefore, efforts to eliminate the hazard justify any expense involved. In November 1948 we added to our control program BCG vaccination of tuberculin-negative professional and nonprofessional groups working in heavily infected areas. To date no case of tuberculosis has developed in the vaccinated group. This is an interesting observation, although I make no claim for its clinical significance, for neither has a case of tuberculosis developed among the positive reactors during this interim. There has been no significant difference in the annual attack rate in the tuberculin-positive or tuberculin-negative groups in this series.

SUMMARY AND CONCLUSIONS

In our experience a tuberculosis hazard exists only for employees in close contact with tuberculosis in hospitals and sanatoriums. The hazard should be recognized but not overly emphasized. The higher rate is partly swelled by repeated reexamination of persons over a period of years. Figures for comparison of similar segments of the population in other occupations are meager. Therefore, the hazard remains in some degree an unknown factor. It should be stressed that clinical disease did not develop in 98.2 per cent of employees exposed in this study, and 28.6 per cent escaped infection sufficient to convert the tuberculin reaction. Our experience indicates that tuberculosis as an occupational hazard may be reduced, and possibly eliminated, by adequate case finding, isolation of infectious cases, the use of sound protective measures for professional and allied workers in close contact with infectious patients or material and BCG vaccination of tuberculin-negative persons required to be in contact with tuberculosis in the course of their employment.

[9] Donlon, M.: Accident Hazards and Costs in Service Industries, Bulletin 5, Workmen's Compensation Board, Department of Labor, New York State, 1950, p. 36.

TREATMENT OF TYPHOID IN PREGNANCY WITH CHLORAMPHENICOL (CHLOROMYCETIN®)*

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Typhoid, in recent years, has been a rare but nevertheless serious complication of pregnancy. Spontaneous abortion or premature labor has occurred in 60 to 80% of such cases. Fetal death in utero is common and has, in some cases, been demonstrated to be due to transmission of the typhoid bacilli from the mother to the fetus.[1] When the disease has been present in the mother for a few weeks, approximately one-half of the fetuses have become so infected. Maternal mortality has been about 15%, while about three-quarters of the fetuses and infants generally have been lost.

In view of the recent reports of the successful treatment of typhoid with chloramphenicol [2] and the fact that we might sometime expect to treat a pregnant woman who had typhoid fever, we undertook to study the transmission of chloramphenicol from the maternal blood to the fetus.

We wished to determine whether chloramphenicol penetrates the human placental barrier in sufficiently high concentration to have an antibiotic effect in the blood of the fetus.

METHOD

A 1-gm. dose of chloramphenicol in the form of four 0.25 gm. gelatin capsules was given by mouth to 20 parturient women from one-half hour to two and three-fourths hours before delivery. Samples of venous blood from the mother and from the veins of the umbilical cord of her infant were taken at the time of delivery. After clotting, the serum was separated by centrifugation and was analyzed by one of us (A. J. G.) for chemical derivatives of chloramphenicol and biologically for the presence of the

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[1] Diddle, A. W., and Stephens, R. L.: Typhoid Fever in Pregnancy: Probable Intrauterine Transmission of the Disease, Am. J. Obst. & Gynec. **38**: 300 (Aug.) 1939. Villarama, A., and Galang, J. S.: Typhoid Fever in Pregnancy, J. Philippine Islands M. A. **10**: 311 (Aug.) 1930.

[2] Woodward, T. E., and others: Preliminary Report on the Beneficial Effect of Chloromycetin in the Treatment of Typhoid Fever, Ann. Int. Med. **29**: 131 (July) 1948. McDermott, W.; Knight, V., and Ruiz-Sanchez, F.: Antimicrobial Therapy in Typhoid Fever, Tr. A. Am. Physicians **62**: 46 (May) 1949. Collins, H. S., and Finland, M.: Treatment of Typhoid Fever with Chloromycetin, New England J. Med. **241**: 556 (Oct. 13) 1949.

antibiotic itself; arylamines were assayed by a modification of Bratton and Marshall's method,[3] and total nitro compounds by reduction with titanium chloride, followed by diazotization and coupling.[4] Chloramphenicol, or unaltered antibiotic, was assayed by microbiological procedures against Shigella sonnei.[5]

RESULTS

Fetal cord blood (venous) was found to contain significant quantities of the antibiotic. The average level of chloramphenicol in the cord blood was 72% of that found in the maternal blood. An appreciable concentration of the antibiotic was present in the cord blood within one hour of ingestion of the drug by the mother, and the concentrations of chloramphenicol in the fetal and maternal veins were roughly the same after two and one-half hours. We therefore judged that chloramphenicol therapy of typhoid in a pregnant woman should be as effective for the fetus as for the mother and, if started early enough in the course of the disease, should prevent fetal death in utero and the subsequent onset of premature labor. We felt that the known high mortality for mother and fetus in typhoid should be reducible to extremely low levels among patients to whom chloramphenicol could be given before the disease had made great inroads. When we had completed our studies, a paper on the subject was published by Ross and associates.[6] In it they stated that "chloramphenicol was observed to pass through the placental barrier and was present in cord blood in a concentration of 50 to 75% of that observed in the maternal blood."

We had no more than completed our studies on the placental transmission of chloramphenicol when a woman in her seventh month of pregnancy and with a severe febrile disease was admitted to Herman Kiefer Hospital, communicable disease division.

REPORT OF CASES

CASE 1.—L. C., a 25 year old Negro woman, was about seven and one-half months pregnant when admitted to the hospital on Sept. 29, 1949. She complained of severe headache, backache, dysphagia, fever, and malaise, all of which had been present for about six days. On Sept. 25, because of the same complaints, a lumbar puncture had been performed in the outpatient department of the hospital, and studies of the fluid indicated the absence of meningitis. On Sept. 27 she had noted regurgitation of swallowed water and subsequently vomited frequently. Her past history was essentially noncontributory. She had given birth to seven children, all girls, in the previous 11 years.

When she was admitted her temperature was 104 F., pulse 134, respiration 40, and blood pressure 128/80, and the spinal fluid showed 14 cells per high power microscopic field. The Pandy test was negative, and the sugar was 00+++. Her red blood cell count was 3,330,000, hemoglobin 55%, leucocyte count 5,950, with 83% polymorphonuclear cells, 14% lymphocytes and 3% monocytes. She was very obese, somewhat somnolent, and her positive physical findings were an injected pharynx, a moderately rigid neck and back, and a pregnant uterus that extended two-thirds of the way from the umbilicus to the xiphoid. The first impression was that she had nonparalytic poliomyelitis in addition to being about 30 weeks pregnant.

She vomited frequently, was receiving parenteral fluids, and her condition remained essentially unchanged. On Oct. 2, when seen in obstetric consultation by one of us (E. C. G.), she was found to be complaining of severe upper abdominal cramps and nausea, and she had vomited several times that day. At that time she had a temperature of 103.8 F. and a pulse rate of 120. She was well hydrated and well oriented. Marked upper abdominal tenderness and some rebound tenderness were present. The diagnosis of typhoid was suggested. She had been receiving penicillin injections and sulfadiazine by mouth.

On Oct. 3 the Widal reaction with the H antibody was negative, but that for the O antibody was positive in a dilution of 1:80. Agglutination tests for paratyphoid A and B and for brucellosis were negative. Blood for culture had been taken, and on Oct. 5 gram-negative rods were found growing in the culture; the next day it was determined that they were typhoid bacilli. Chloramphenicol treatment was begun at once. Since the patient was vomiting, the capsules were punctured at several points with a pin and, following a rinsing out of the sigmoid and rectum, were inserted into her rectum; she received 1.5 gm. every eight hours.

Thirty hours after the commencement of chloramphenicol therapy the patient's temperature began to fall from an average high of 102.6 F., and within 36 hours it reached 98.2 F. There was also a marked symptomatic improvement during this period in that she became alert, stopped vomiting, expressed hunger and ceased to have abdominal pain. Because of a low hemoglobin she was given two 500-cc. blood transfusions. The fetus remained active. Defecation was normal, and she shortly began to eat a full diet.

Stools taken for culture on Oct. 5 were negative for typhoid bacilli, while those taken on Oct. 18, 21 and 22 were positive. Cultures of stools taken on Oct. 29 and Nov. 7 were negative. All urine cultures were negative for this organism.

Chloramphenicol therapy was stopped on Oct. 18, after 12 days of continuous therapy at the rate of 4.5 gm. per day, or a total dosage of 54 gm.

The patient was up and walking about the ward for the last week of hospitalization and was discharged on Nov. 18 in good condition. At her discharge the fetus was active and lay in right occiput transverse position with its head not engaged. Her blood pressure was 128/70, and her urinalysis was negative.

On Dec. 26 the patient was readmitted to the communicable disease division of Herman Kiefer Hospital in active labor. Because she was a potential typhoid carrier she was kept in isolation. After three hours of labor she spontaneously delivered herself of a 4,320 gm. female infant who cried and breathed at once. The infant was normal and was given regular formula feedings. All tests made on it were negative for typhoid. The mother had a normal postpartum course, and was discharged with her infant on Dec. 31.

Repeated periodic cultures of the stools of both mother and infant, from the time of delivery, have been negative. The last materials for culture were taken on March 8, 1950.

CASE 2.—M. L., a 23 year old nulliparous graduate nurse, whose last menses began on March 7, 1950, was admitted to Grace Hospital on May 24 with a temperature of 100.6 F. and a pulse rate of 100. For three days prior to admission she had noted a mild painful urgency to defecate and slight deep pelvic discomfort during defecation. The pain was spasmodic, periumbilical in location, and was relieved by defecation. The stools had been of normal consistency, but expulsion was noted to be unusually rapid and forceful. She had not noted any blood or mucus in her stools.

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[3] Bratton, A. C., and Marshall, E. K., Jr.: New Coupling Component for Sulfanilamide Determination, J. Biol. Chem. **128**: 537 (May) 1939.

[4] Glazko, A. J.; Wolf, L. M., and Dill, W. A.: Biochemical Studies on Chloramphenicol (Chloromycetin): Colorimetric Method for the Determination of Chloramphenicol and Related Nitrocompounds, Arch. Biochem. **23**: 411 (Oct.) 1949.

[5] Joslyn, D. A., and Galbraith, M.: A Turbidimetric Method for the Assay of Antibiotics, J. Bact. **54**: 26 (July) 1947.

[6] Ross, S.; Bischoff, H.; Preisser, W., and Orr, W.: Some Observations on the Absorption and Excretion of Aureomycin and Chloramphenicol, J. Clin. Invest. **28**: 1050 (Sept. pt. 1) 1949.

Her pregnancy had otherwise progressed normally until the night of May 23 when she noted the fairly rapid onset of a sharp, low frontal headache, with "burning" of the eyes and some malaise. She went to bed early but was awakened at 6 A. M. by nausea and a severe headache. She vomited several times and, feeling weak and ill, returned to bed. She next awakened at 10 A. M., and, finding some bright red blood stains on her nightgown, discovered slight vaginal bleeding. There were no uterine cramps, but she noted recurrence of the periumbilical cramps and her headache and malaise persisted.

She was admitted to the hospital by one of us (C. S. S.) that afternoon, at which time she exhibited a flushed face and obvious malaise. The positive physical findings were a definite gravid firmness of the breasts, increased frequency and pitch of the small-bowel sounds on abdominal auscultation, the presence of a small amount of dark brown and somewhat watery vaginal discharge, and, on rectal examination, the enlargement of the uterus to the size of an eleven weeks' pregnancy. The uterus was tense, lay between anterior and middle position, and the ovaries were normal. Acute enteritis of an unknown type and threatened miscarriage of an eleven weeks' pregnancy were suggested.

Because of the obvious signs of acute enteritis, the severe malaise, and the fact that one of us, the examiner (C. S. S.), had started to write this paper and had typhoid in mind, a Widal test and stool cultures were ordered, and complete bed rest and isolation were prescribed for the patient.

The results of the Widal reaction were obtained on May 26, the O antibody was positive 1:320 and the H antibody positive 1:80. Agglutinations for paratyphoid A and B and for brucellosis were negative. The taking of blood for culture had also been intended, but, by error, was omitted at this time. Stool cultures were negative for typhoid bacilli. It was judged that the patient had typhoid, and chloramphenicol therapy was begun on the afternoon of May 26. She received 1 gm. during the first two hours; 0.5 gm. was then given four times that day. The following day her temperature was 98.2 F. and the pulse rate was 72. She no longer had headache or malaise, and the abdominal cramps had ceased. On May 28 and 29 she remained symptom free, but had one temperature reading of 100 F. From then on her temperature and course were entirely normal, and she had no further vaginal bleeding.

On June 4 the patient was transferred to the communicable disease division of Herman Kiefer Hospital, where her chloramphenicol therapy was continued. The Widal test was repeated; the reaction with the O antibody was negative, but that with the H antibody was positive in a dilution of 1:640. Other agglutination tests were negative. She had no uterine cramps or vaginal bleeding and was discharged to her home on June 6. She received chloramphenicol for 12 days, a total dose of 25 gm. She remained well at home until June 18, when she again had some slight vaginal bleeding and also some lower mid-line abdominal cramps. She was put to bed, but the following day miscarried a relatively small and collapsed ovisac containing a markedly macerated and amorphous fetus measuring about 2.5 cm. in length. The ovisac was complete and curettage was not performed. Following this she had an uneventful recovery.

COMMENT

These two cases demonstrate not only the efficacy of chloramphenicol in the treatment of typhoid, but also the possibility of saving the fetus when the drug is given in proper dosage and begun early enough in the course of the disease in a pregnant woman. The first patient received adequate dosage, and the fetus continued on through the pregnancy. All studies made on it following delivery were negative for typhoid. We cannot know whether it ever did develop intrauterine typhoid but, since it was entirely normal at and following delivery and since chloramphenicol therapy was commenced on the 12th day of the patient's illness, it is probable that the fetus had not yet contracted this disease at the time chemotherapy was begun.

The second patient began to receive chloramphenicol on the fourth day of her disease, but, in retrospect, it is believed that she was not given an adequate daily dosage of this drug. She should have received 4 gm. instead of 2 gm. daily. Even this dosage, however, probably would not have permitted the fetus to survive, since we have long known of the relatively great frequency of fetal death during the first trimester of pregnancy in women who have a systemic infectious disease. In this case the extreme maceration of the fetus and its relatively small size probably indicate that it died in the first few days of the disease, and the effect of the chloramphenicol had probably come too late to save it. Furthermore, the signs of threatened miscarriage and the onset of typhoid occurred simultaneously, and we cannot be certain that fetal death in utero in this case occurred as a direct result of the typhoid.

CONCLUSIONS

Typhoid during pregnancy, although very rare, when not treated with a specific chemotherapeutic agent can result in fetal loss in 60 to 80% of cases, and the maternal mortality may run as high as 15%.

Chloramphenicol has proved to be a most efficacious chemotherapeutic agent in the immediate treatment of typhoid and has resulted in a marked lowering of the mortality rate of this disease.

It has been demonstrated, in pregnant women at term, that chloramphenicol passes from the maternal to the fetal blood stream in one hour following its ingestion, that it there attains a concentration equal to three-fourths of that in the maternal stream, and that the blood concentrations of mother and fetus are relatively the same after two and one-half hours.

Two cases of typhoid in pregnancy, in which chloramphenicol therapy was utilized, are presented, and the results are considered to be quite satisfactory.

It is believed that the proper dosage of chloramphenicol, in treating such cases, should be a minimum of 4 gm. daily over a period of 12 days.

1512 St. Antoine St.

Fetal Malformation.—Whilst the genetics of some rare deformities are clear, the most common conditions are difficult to attribute to unique causes. Many types of adverse circumstances, genetical or environmental acting either separately or in collaboration, are implicated. At the critical stages of embryonic development during the first two to three months, similar pathological reactions leading to malformation may be induced by quite diverse causes. The present state of knowledge is very incomplete but advances are now rapidly being made. The fact that the causes of fetal malformations are multiple and that so many environmental causative influences are being detected, is leading to a much more promising view of the possibilities of prevention than was entertained some years ago, when almost all congenital defects were believed to be due to inexorable heredity.—L. S. Penrose, M.D., Heredity and Environment in the Causation of Fetal Malformation, *The Practitioner,* May, 1951.

NATURE OF WATERHOUSE-FRIDERICHSEN SYNDROME

REPORT OF CASE WITH SUCCESSFUL TREATMENT WITH CORTISONE

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The Waterhouse-Friderichsen syndrome has long been notable among infectious diseases for having a fundamentally twofold character: an acute infection together with profound circulatory collapse. It is the conjunction of these two factors that has given the syndrome an intensity and a rapidity of progression unparalleled among bacterial diseases. "No other infection slays so quickly," said Herrick.[1] And Martland,[2] reporting from his experience as a medical examiner, was able to collect 19 cases which had been referred to his office after sudden, unexplained, and sometimes suspicious death in children and young adults. Many of these patients were found dead in their beds; others died on arrival or within a few hours after arrival at the hospital. Not only was death swift; it was also certain. In 1938 Christian,[3] long a close student of this disease, wrote that all known cases had been fatal, generally in less than 24 hours.

However, shortly thereafter, with the advent first of the sulfonamides and then penicillin, cases of Waterhouse-Friderichsen syndrome ending in recovery began to be observed. The first of these was the one reported by Carey[4] in 1940. From that time until the present there have appeared occasional instances of cure. Nevertheless, it has remained evident, both from the relative scarcity of cases with recovery and from the experience of one of us (J. N.), that the Waterhouse-Friderichsen syndrome has continued to be a serious condition with a grave outlook. Surely it has not shared in the remarkable improvement of prognosis exhibited by meningococcic infections in general during this period, which has witnessed rates of recovery ranging from 95[5] to 98.5%.[6]

There is little doubt that the reason for this disparity lies in the fact that together with the severe, sometimes fulminating, infection there exists a most profound circulatory collapse. Indeed, one might almost say that these patients would recover routinely, as do the others with meningococcic infection, if they could be kept alive through the phase of shock. Toward this end have been employed such nonspecific measures as infusion of saline solutions, plasma, and blood, and the presumably more specific therapy of adrenal replacement.

With regard to the former there is general agreement that neither infusions nor transfusions are of much avail. The investigations of Ebert and Stead[7] into the nature of collapse in bacterial infections have shown that it is not of the same character as the shock following hemorrhage or trauma; it is not related to hemoconcentration, nor does it result from diminution of venous return to the heart. Neither is aid from such measures to be expected therefore, nor has it been obtained by those who have used them.[8] Although adrenal cortex substances, which have heretofore been available in the form of desoxycorticosterone and aqueous extract of the adrenal cortex, have seen sporadic use during the past decade, it has been difficult to determine whether and to what extent they have aided in treatment. Their employment in combination with antibacterial agents has resulted in prolongation of life and sometimes in recovery; however, their effect has been far from striking and has been considered by many to be negligible. They have been administered, of course, as replacement therapy, but their physiological scope is limited, and it may be questioned whether they do indeed constitute adequate replacement. Beyond this, many have raised the larger question whether adrenal insufficiency plays any significant part in the clinical picture.

NATURE OF THE CONDITION

The Waterhouse-Friderichsen syndrome has retained its eponymic designation largely because various investigators have differed regarding both its pathology and its pathogenesis. It is caused by meningococcic invasion in almost all cases, although other organisms such as staphylococci, streptococci, and pneumococci occasionally have been found responsible.[9] It has an incidence of from 2 to 4% of the cases of meningococcic infection,[10] with a considerable predilection for children; Lindsey[11] reported that in 90% of the known cases the syndrome occurred in children under the age of 9 years.

Clinical Picture.—This is remarkable for the intensity and the rapidity of progression of which we have spoken. The invasive phase resembles that of many acute infections, with fever, malaise, headache with generalized aching, sometimes accompanied with vomiting or chills;

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[7] Ebert, R. V., and Stead, E. A., Jr.: Circulatory Failure in Acute Infections, J. Clin. Investigation **20**:671, 1941.

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[9] (*a*) Weinberg, L. D., and McGavack, T. H.: The Waterhouse-Friderichsen Syndrome: Report of a Case with Recovery, New England J. Med. **232**:95, 1945. (*b*) Firor, W. M.: Adrenal Hemorrhage in Children, South. M. J. **30**:306, 1937.

[10] (*a*) Bernhard, W. G., and Jordan, A. C.: Bilateral Adrenal Hemorrhage (Waterhouse-Friderichsen Syndrome) Associated with Meningococcal Septicemia, J. Lab. & Clin. Med. **29**:357, 1944. (*b*) Bush, F. W., and Bailey, F. R.: Treatment of Meningococcus Infections with Especial Reference to the Waterhouse-Friderichsen Syndrome, Ann. Int. Med. **20**:619, 1944. (*c*) Meyer, R. R.: Meningococcal Meningitis: Report of 33 Cases with No Deaths, New England J. Med. **230**:452, 1944.

[11] Lindsey, in Christian.[3]

these often elicit a diagnosis of grip. Then, in a matter of four to 12 hr., there appear a massive and widespread hemorrhagic rash and severe toxicity, often with an abrupt rise of temperature to higher levels and sometimes convulsions. There follows, almost under the eyes of the observer, a profound collapse which features, in addition to the signs of hypotension, a striking cyanosis with lividity of the dependent parts which is almost deathlike. Irreversible shock with coma follows hard upon this, with death itself occurring usually within 24 hr. after onset of the illness. Signs of meningitis may be present, but usually they are not pronounced and may even be entirely absent, chiefly for the reason that the syndrome evolves so rapidly.

Though it has not been possible to make more than sporadic investigation of the chemical alterations in the blood, certain facts are evident. Azotemia occurs in almost all cases, presumably in consequence of the combined impact of dehydration and collapse on renal function. Marangoni and D'Agati [12] have reported two cases with the renal findings of lower-nephron nephrosis. Hypoglycemia regularly is encountered [13] and has been considered a specific consequence of adrenal cortex damage. It is interesting to observe, however, that the serum electrolytes, which have been the object of most attention, undergo relatively little alteration. Although some cases exhibit the diminution of sodium and chloride and the elevation of potassium, which are characteristic of lack of adrenal cortex function, numerous observers have found these constituents to be either normal or little changed therefrom.[14]

Pathological Examination.—The body as a whole bears evidence of a brief, severe infection, frequently with the additional changes resulting from a state of shock. There are acute passive congestion of the lungs, toxic degeneration with cloudy swelling of the liver, kidneys, and often the myocardium, and acute splenic tumor; further, there may be incipient inflammation of the meninges. More marked than in most infections is the considerable engorgement of the smallest vessels throughout the body. This is doubtless responsible, at least in part, for that remarkable shifting cyanosis which may even precede the appearance of shock. Further, it is likely related to the occurrence of hemorrhages which are so characteristic of meningococcic infection, these being found as multitudinous small purpuric areas not only in the skin but throughout the parenchymatous organs and on the serosal surfaces. Hill and Kinney,[15] in a careful pathological study of such skin lesions, have demonstrated that the dilatation, chiefly of the capillaries but also in some degree of the arterioles and venules, is followed by swelling and breakdown of the endothelium and by large numbers of platelet thrombi. The ischemic necrosis of the subserved areas leads to hemorrhage into the perivascular spaces. The additional possibility is considered by these authors that a secondary thrombopenia incident to the aggregation of platelets into thrombi may contribute its share to the hemorrhagic tendency. Alternatively, bacterial embolization to the small vessels may initiate a similar sequence. It should be noted, however, that the hemorrhagic lesions, except possibly in the rare instances of gross bleeding into the intestine, pleura, or subdural space,[16] are not of such magnitude as to be capable of causing vascular collapse through the mechanism of blood loss.

Pathologic Changes in the Adrenals.—The agreement regarding these foregoing clinical and pathological features, however, does not obtain with respect to the adrenal glands; for there has arisen considerable difference of opinion among various investigators regarding the pathological changes to be found in the adrenal cortex and their role in the production of the clinical syndrome. In the early reports before the turn of the century, Voelcker,[17] Battin,[18] and Garrod and Drysdale,[19] described the occurrence of gross adrenal hemorrhage sufficient to destroy the entire gland and to convert it into a mass of blood. In 1901 Little [20] construed a relation between this pathologic change and the occurrence of collapse, although he speculated on the adrenal medulla in this regard. As the functions of the different parts of the gland became increasingly defined, interest centered on the cortex, but the relation between the adrenal pathology and the shock continued to be asserted. By 1936 Aegerter [21] was able to collect 55 cases of the Waterhouse-Friderichsen syndrome, with gross hemorrhage into both adrenals in 51 cases and into one adrenal in three cases.

However, in 1942 Williams [22] reported that of 17 cases of the syndrome adrenal hemorrhage was found in only nine. Martland,[2] Thomas and Leiphart,[23] Schwarz,[24] and Daniels,[5] the last-named on the basis of experience similar to that of Williams, have expressed the belief that the clinical evolution of the Waterhouse-Friderichsen syndrome results from the fulminating sepsis, that adrenal hemorrhage is not an invariable concomitant, and that when it does occur it is incidental to the total pattern.

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[23] Thomas, H. B., and Leiphart, C. D.: Septicemia and Purpura with Adrenal Hemorrhage in the Adult (Waterhouse-Friderichsen Syndrome), J. A. M. A. **125**: 884 (July 29) 1944.

[24] Schwarz, J.: Adrenal Hemorrhages in Meningococcal Sepsis, Arch. Path. **41**: 503 (May) 1946.

It remained for Rich and others [25] to bridge the difference between these points of view by a more intimate study of the pathological changes than had been made previously. On gross observation his experience paralleled that of Williams, for, notwithstanding the regular occurrence of adrenal hemorrhage among infants, most adults dying of the disease had either no hemorrhage or but insignificant petechial bleeding. However, microscopic examination revealed a remarkable type of damage which he termed "tubular change," an alteration which appears to be but one aspect of the severe degeneration of the adrenal cortex which is uniformly found in those instances in which hemorrhage has not obliterated all evidence. This degeneration is apparently related to the fulminating nature of the process, being more marked in this than in other infections. Moreover, it does not result from vascular collapse, inasmuch as it is not to be found after shock following blood loss or trauma. Beginning in the fasciculus but proceeding to neighboring zones, the pyknotic degeneration and loss of substance of the cell cords opens them to dissection by hemic elements and to conversion into tubular structures filled with blood cells and fibrin. Together with this there is a shrinkage of the cords away from the perivascular spaces, with ensuing loss of support for the blood vessels. These changes, in themselves indicative of cellular damage of such degree as seriously to impair the functioning of the adrenal cortex, occur in the context of the vascular dilatation and capillary damage already described. With the adrenal cortex the site of so rich a blood supply, it is clearly a short step to hemorrhage into and about the cell cords and, indeed, to gross bleeding, which inundates the organ and destroys it completely. It becomes evident, then, that the pathological change may be viewed as a process advancing from cellular degeneration toward obliterating hemorrhage, or as stopping at any point along the way.

Pathogenesis.—These considerations may permit a better understanding of the Waterhouse-Friderichsen syndrome and help reconcile the diverse opinions which exist regarding its pathogenesis. Those who have doubted any specific relation of adrenal damage to the clinical picture have been impelled to this view not only by the finding, already discussed, that gross hemorrhage is often lacking but also by the observation that collapse supervenes with great rapidity and in the face of maintained electrolyte levels in the blood serum. It clearly would appear necessary to examine these questions not in terms of hemorrhagic destruction but in those of adrenal function in relation to the changing needs of the body.

Dogs subjected to adrenalectomy [26] display anorexia followed by vomiting and diarrhea; their initial listlessness gives way to weakness, hypotension, coma, and finally death in a state of shock. This deterioration takes place relatively slowly, and the animals survive about seven days. Unlike the removal of the adrenal gland in an otherwise normal animal, however, it is evident that in the Waterhouse-Friderichsen syndrome the exhaustion of the adrenal cortex occurs in the full tide of a severe infection and as a result of the stress imposed by that infection. Zwemer [27] has shown that the cells of the adrenal cortex, especially in the outer fasciculate and glomerular zones, contain lipid globules; these have been closely identified with the stored hormone.[28] Sarason [29] and others [30] have pointed out that both in experimental animals under metabolic stress and in persons with serious infection there occurs a pronounced diminution of the lipid deposits which, in cases of fatal infection, may be completely exhausted.[31] That this loss of lipid substance is not merely a toxic effect of stress but indeed truly represents the increased utilization of the hormone by the body under stress is revealed by the study of Thorn and associates.[32] They showed that in patients under treatment with desoxycorticosterone for Addison's disease the advent of infection necessitated the administration of increased amounts of the hormone. It is also revealed by Shipley's finding of increased urinary cortin after infection or injury.[33] Under conditions of stress the stored hormone enters the circulation and the cells degenerate from their normal globular condition to a granular or homogeneous one. Selye [30b] and Zamcheck [34] have demonstrated that under marked stress this degeneration may take the form of widespread cytolysis leading to the "luminal" or "tubular" change of Rich. Thus, the available store and the source of further supply of the cortical hormone are abolished, and the gland suffers physiological ablation precisely when the need for its product is greatest. It is this crisis which precipitates the collapse in all its speed and severity.

The relative maintenance of electrolyte levels, to which allusion has already been made, constitutes a most interesting finding in the face of the presumed cortical deficiency. It has been conjectured that the very rapidity with which the syndrome advances may preclude alteration in the electrolyte balance of the serum on a large scale. It appears likely, however, that other factors may be at work in addition. Both febrile dehydration and shock, with its alterations of renal function, serve to concentrate the constituents of the blood. Hence, the maintenance of electrolytes must be understood in relation to the several, and in some cases mutually contradictory, factors which help determine the resultant levels. Thorn,[35] writing of acute adrenal insufficiency precipitated in patients with potential insufficiency by the stress of surgery or trauma, adds:

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[25] (*a*) Rich, A. R.: A Peculiar Type of Adrenal Cortical Damage Associated with Acute Infections, and Its Possible Relation to Circulatory Collapse, Bull. Johns Hopkins Hosp. **74**: 1, 1944. (*b*) Loucadou, in Selye, H., and Stone, H.: On the Experimental Morphology of the Adrenal Cortex, Springfield, Ill., Charles C Thomas, Publisher, 1950.

[26] Rogoff, J. M., and Stewart, G. N.: Studies on Adrenal Insufficiency in Dogs, Am. J. Physiol. **78**: 711, 1926.

[27] Zwemer, R. L.: A Study of Adrenal Cortex Morphology, Am. J. Path. **12**: 107, 1936.

[28] Bennett, H. S.: Life History and Secretion of the Cells of the Adrenal Cortex of the Cat, Am. J. Anat. **67**: 151, 1940.

[29] (*a*) Sarason, E. L.: Morphologic Changes in the Rat's Adrenal Cortex Under Various Experimental Conditions, Arch. Path. **35**: 373 (March) 1943. (*b*) Sarason, E. L.: Adrenal Cortex in Systemic Disease: Morphologic Study, Arch. Int. Med. **71**: 702 (May) 1943.

[30] (*a*) Dosne, C., and Dalton, A. J.: Changes in the Lipoid Content of the Adrenal Gland of the Rat Under Conditions of Activity and Rest, Anat. Rec. **80**: 211, 1941. (*b*) Selye, H., and Stone, H.: On the Experimental Morphology of the Adrenal Cortex, Springfield, Ill., Charles C Thomas, Publisher, 1950.

[31] Nieburg, H. E.: Hormones in Clinical Practice, New York, Paul B. Hoeber, Inc., 1950.

[32] Thorn, G. W.; Dorrance, S. S., and Day, E.: Addison's Disease: Evaluation of Synthetic Desoxycorticosterone Acetate Therapy in 158 Patients, Ann. Int. Med. **16**: 1053, 942.

[33] Shipley, R. A.; Dorfman, R. I.; Buchwald, E., and Ross, E.: The Effect of Infection and Trauma on the Excretion of Urinary Cortin, J. Clin. Investigation **25**: 673, 1946.

[34] Zamcheck, N.: The Normal Human Adrenal Cortex and Its Response to Acute Diseases, Am. J. Path. **23**: 877, 1947.

[35] Thorn, G. W.: The Diagnosis and Treatment of Adrenal Insufficiency, Springfield, Ill., Charles C Thomas, Publisher, 1949.

> Under these circumstances, operation may easily precipitate an acute adrenal crisis. Signs and symptoms of adrenal failure are most likely to develop twelve to forty-eight hours post-operatively. . . . The striking dehydration [i. e. of adrenal origin] and alteration of serum electrolytes so characteristically seen in chronic adrenal insufficiency may not be present in these acute cases.

In the light of these considerations the following case of Waterhouse-Friderichsen syndrome is presented. It is the first, to our knowledge, in which cortisone has been used.

REPORT OF CASE

An 11-yr.-old boy complained one day of nasopharyngitis and mild epigastric pain. That evening he awakened from a sound sleep with nausea and severe vomiting, and he felt feverish. Some six hours later he suffered a generalized convulsion followed by stupor. He was admitted to the Lincoln Hospital on the morning of June 19, 1950.

At the time of admission he appeared a small boy who was acutely and severely ill with a temperature of 105.4 F. and the facies of shock. His pulse, at a rate of 140 a minute, was thready, and the blood pressure, obtained with difficulty, was 70 mm. of mercury systolic and 20 diastolic, though the heart sounds were of fair quality. He was in stupor and could be roused but momentarily by supraorbital pressure. His respiration rate was 30 a minute, and there was moderate cyanosis of the lips and nail beds. The skin and mucous membranes were the site of a widespread petechial eruption, and there was a diffuse tonsillopharyngitis. Neither meningeal nor focal neurologic signs were in evidence.

Lumbar puncture made at the time of admission elicited a clear fluid containing 20 mononuclear cells and 21 mg. of protein and 76 mg. of sugar per 100 cc.; no organisms were found either by smear or on culture. A smear taken from a purpuric lesion was likewise negative. However, both blood and throat culture revealed Neisseria meningitidis.

Therapy was promptly instituted in the form of an infusion of 5% dextrose in isotonic sodium chloride solution containing 3 gm. of sulfadiazine sodium together with 5 cc. of adrenal cortex extract (eschatin®). An additional 15 cc. of cortex extract was administered both intramuscularly and intravenously, and penicillin was given intramuscularly every three hours in doses of 100,000 units of an aqueous solution.

During the first hospital day the patient's course was featured by the striking increase of the rash, which came to cover the entire body in the form of large purpuric lesions, and by the persistence of the state of shock. The blood pressure remained at 50 mm. of mercury systolic and 20 diastolic, and there was almost complete anuria, but 15 cc. of urine being obtained by catheter during this time. Administration of sodium sulfadiazine therefore was discontinued after a total of 4 gm. had been given. Cortical extract was continued in doses of 10 to 15 cc. in every 12 hr. but apparently was without effect; an infusion of 250 cc. of plasma conferred but transient benefit.

The subsequent administration of additional infusions of dextrose in isotonic sodium chloride solution, two injections of ephedrine, and the repeated administration of cortical extract were similarly without avail, and the condition of the patient deteriorated steadily during the second hospital day. The state of collapse was unrelieved, and anuria was complete, the nonprotein nitrogen level being 75 mg. per 100 cc. The sugar content of blood taken at this time was at the hypoglycemic level of 40 mg. per 100 cc. Toward the middle of this day all medication save penicillin was discontinued, and the patient appeared moribund.

At this time 37.5 mg. of cortisone was administered, to be followed at six hour intervals by two additional doses of equal size. Within four hours after the initial administration of cortisone the patient exhibited a remarkable degree of improvement. The blood pressure rose to 100 mm. of mercury systolic and 60 diastolic, the pulse became full and bounding, the color improved, and the patient excreted 150 cc. of urine. In the 6 hours following the blood pressure attained a level of 130/80 and subsequently did not fall below 100/70; the pulse rate fell to 110 a minute and remained full.

During the third hospital day the patient became alert and rational, though with severe pains and hyperesthesia in all the extremities. The cerebrospinal fluid at this time contained 31 mononuclear cells but was normal in other respects. The output of urine was normal, and the nonprotein nitrogen level had fallen to 48 mg. per 100 cc. An indwelling catheter which had been in place since admission was removed, and chloramphenicol (chloromycetin®) was administered at the rate of 1.5 gm. a day for the prophylaxis of urinary-tract infection.

In the days that followed the course continued favorable. The purpuric rash faded except in those areas on the extremities in which local necrosis, followed by sloughing, necessitated local treatment, and these cleared in turn. By the seventh hospital day the use of penicillin and chloramphenicol was discontinued. And on the 14th hospital day, after reexamination of the blood showed it to be normal in all respects, the patient was discharged as cured.

COMMENT AND SUMMARY

We have described the case of a child with fulminating meningococcic sepsis complicated by profound collapse, anuria, and hypoglycemia (the syndrome described by Waterhouse and Friderichsen). After the administration of dextrose in isotonic sodium chloride solution, plasma, and adrenal cortex extract had proved unavailing, the administration of cortisone was followed by dramatic recovery from the state of shock. This observation supports the hypothesis held by many, yet recently called into question, that adrenal damage plays a central role, together with acute sepsis, in the determination of the clinical picture of the syndrome.

Beyond this, the observation touches on the larger, vital questions concerning the nature of infectious stress and of the collapse which may attend it. Some evidence has been presented and more is at hand to show the impact of infection on the adrenal glands, and it is suggested that their exhaustion and the breakdown of their function may have a critical part in the outcome of severe or uncontrolled infections. The recent work of Finland [36] is of interest in this regard.

The nature of shock in these conditions appears to be different from that following trauma, hemorrhage, or even slowly developing adrenal insufficiency. It is not related simply to the diminution of blood volume. Neither has sufficient electrolyte imbalance been found in these cases, nor have blood, plasma, or salt solutions conferred significant benefit. Desoxycorticosterone, effective in the control of electrolyte distribution, has been of doubtful value and adrenal cortex extract of limited effect.

In the light of these considerations, it appears that when shock occurs in infectious diseases it may come about by a different mode of pathogenesis, possibly related to the profound effects of the 11, 17-oxysteroids on the surface of tissue cells and on the permeability of their membranes. The recent advances in our understanding of adrenal cortex physiology, culminating in the discovery of cortisone and its application to clinical medicine, introduce new elements into the situation, and it may now become possible both to elucidate the fundamental nature of these cases and vastly to improve their outcome.

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[36] Finland, M., in Mote, J. R.: Proceedings of the First Clinical ACTH Conference, Philadelphia, The Blakiston Company, 1950.

ADDENDUM

Since the foregoing report was submitted for publication, one of us (J. N.) saw another case of the Waterhouse-Friderichsen syndrome successfully treated with cortisone (From the Medical Service, Dr. B. Pasquarelli, director, Fordham Hospital).

On Jan. 28, 1951, a 28 year old woman was admitted to the hospital with a one-day history of pain in the neck and back, vomiting, and increasing confusion. She was febrile and delirious. The neck was moderately stiff. The blood pressure was 130/70. The pulse rate was 110 a minute. Lumbar puncture revealed the spinal fluid to be under increased pressure with polymorphonuclear pleocytosis and gram-negative cocci which proved to be Neisseria meningitidis.

An infusion of isotonic sodium chloride, containing 4 gm. of sulfadiazine sodium, was given. In addition, one million units of penicillin was administered intravenously and intramuscularly, and 1 gm. of streptomycin was injected intramuscularly, as was 2 cc. of adrenal cortex extract (eschatin®). Further therapy consisted of 600,000 units of penicillin every three hours, 0.1 gm. of sulfadiazine every four hours, 2 cc. of adrenal cortex extract every six hours, and 0.5 gm. of streptomycin every 12 hours; later, the streptomycin was replaced by 100 mg. of aureomycin every six hours.

During the 24 hours following her admission, the patient's condition grew worse: signs of meningeal infection increased, the rash spread and assumed a universal, purpuric character, and the blood pressure declined to 80/50. The patient became comatose, was in collapse, and appeared moribund.

At this point, cortisone therapy was instituted, 100 mg. being administered intramuscularly every six hours. The patient began to exhibit a favorable response within a few hours and then improved steadily. The state of shock receded. The coma lessened. During the subsequent 12 to 18 hours of the second hospital day, the pulse became stronger and the blood pressure rose to 100/75.

On the third hospital day, the patient was oriented and reasonably alert. The blood pressure was maintained at normal levels. The rash began to fade. The urea-nitrogen level in the blood was 15 mg. per 100 cc. and the sugar 140 mg. per 100 cc. Many polymorphonuclear cells were still to be found in the cerebrospinal fluid, and its protein level was 360 mg. per 100 cc.; but the sugar was 58 mg. per 100 cc., and the fluid was sterile.

The administration of cortisone was discontinued when a total of 500 mg. had been given. The subsequent course was uneventful; after 10 days, the patient was discharged as cured.

535 Park Ave. (Dr. Nelson).

THE DETECTION OF PELVIC CANCER

Howard W. Jones Jr., M.D., Baltimore

Cancer of the genital organs accounted for 24.2% of all deaths due to cancer in females in 1947 in the United States.[1] The uterus is by far the most frequent site, uterine cancer accounting for 18.1% of the deaths. If cervical cancer accounts for approximately 80% of all uterine cancer, the deaths from cervical cancer alone may be estimated to make up about 14% of all deaths due to cancer in females. This is important when one considers that Stage I cancer of the cervix (as classified according to international agreement adopted at the International and Fourth American Congress on Obstetrics and Gynecology, New York, May, 1950) can be cured in 80% of all patients and international Stage 0 cancer in approximately 100%; yet the general survival rate from carcinoma of the cervix is in the neighborhood of 30%, because of a preponderance of advanced cases.

For many years, but with recently renewed vigor, organized effort has been made to educate the public and the profession in the early symptoms, diagnosis, and therapy of cancer. It seems reasonable that efforts in this field should be sustained by the American Cancer Society. It must be realized, however, that complete education of the public and profession would probably not result in discovery of all pelvic carcinomas in an early stage, for the biological behavior of the disease in many instances results in its insidious development. At the Cardiff Royal Infirmary, Cardiff, Wales, for example, more than one-half of all women seen within three months of the first symptom were classified as having Stage III or IV carcinoma of the cervix.[2] For this reason a periodic pelvic examination has been suggested as a means of diagnosing asymptomatic pelvic cancer. It is not the purpose of this paper to contrast the result of public and professional education with the value of periodic pelvic examination of asymptomatic women, but rather to assess the value of the latter in statistical terms and to comment on the adequacy of new and old procedure in the detection of asymptomatic pelvic cancer.

MATERIAL AND METHODS

The statistics are taken from results of 8,955 examinations of women in detection centers in Maryland that were sponsored by the Maryland Division of the American Cancer Society. These women were given a general examination, but only the pelvic findings are reported herein. The examinees were considered to be well. There is opportunity for debate on this point, as the line between illness and health is not sharp. Women with gross complaints were eliminated, and those admitted considered themselves well. However, in many instances expert questioning often revealed symptoms of pelvic disorders.

Although these were detection-center examinations, there is no reason to believe that the yield of abnormal findings would be less if adequate routine pelvic examinations were done on

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Read before the Section on Obstetrics and Gynecology at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 29, 1950.

Gynecologists currently serving on the staff of one or more cancer-detection centers in Baltimore are Dr. C. Bernard Brack, Dr. Ernest I. Cornbrooks Jr., Dr. William K. Diehl, Dr. Everett S. Diggs, Dr. Gerald A. Galvin, Dr. Theodore Kardash, Dr. Edward H. Richardson Jr., Dr. Stuart Rizika, and Dr. J. Donald Woodruff.

[1] Vital Statistics of the United States, Federal Security Agency, United States Public Health Service, Office of Vital Statistics, 1947, Pt. II.

[2] Maliphant, R. G.: Cancer of Cervix Uteri: Results of Treatment with Radium, J. Obst. & Gynaec. Brit. Emp. 54:155, 1947.

patients who present themselves in physicians' offices with complaints referable to other parts of the body.

The pelvic portion of the examination consisted of history, inspection of the external genitalia, bimanual palpation, speculum examination of the cervix and vagina, biopsy of any available lesion, and cytological examination of material from the cervix and posterior fornix in about the last one-half of the series. A wooden spatula was used for the smear. The examinations were done between Nov. 1, 1946, and Feb. 28, 1950.

In order to assess the value of a detection examination and in order to determine the supplementary yield of cancer diagnosis from additional procedures recommended on the detection examination, an attempt has been made to follow a sample of the examinees. Of 10,111 male and female examinees 5,353 were followed. This included about one-half of the 8,955 female examinees reported on herein. Well examinees were followed six months after examination and those with abnormalities two months after examination. Sixty-two per cent of all examinees were successfully contacted by mail. In presenting the findings, a distinction has been made between the diagnoses on the detection examination per se and the supplementary diagnoses made by means of procedures carried out by the examinees' physicians. The latter group was revealed by the follow-up study and is, therefore, incomplete.

TABLE 1.—*Detection-Center Diagnosis*

	No.	(No.)*	%
No pelvic abnormality	6,511	(0)	72.7
Cancer	17	(5)	0.2
Major pelvic disease	446	(190)	5.0
Minor pelvic disease	1,981	(657)	22.1
Total	8,955	(853)	100.0

* Numbers in parentheses indicate examinees with multiple findings.

TABLE 2.—*Abnormal Conditions Noted in the 2,444 Examinees with Pelvic Disorders*

	External Genitalia	Vagina	Cervix	Fundus	Adnexa
Cancer	..	...	17	...	...
(Cancer diagnosed later...	..	...	4	2	...)
Leucoplakia	41	...	...	...	...
Relaxation	..	325	...	...	...
Cervicitis	..	...	1,633	...	...
Myomas	..	...	...	299	...
Retroposition	..	...	...	240	...
Menometrorrhagia	..	...	...	277	...
Adnexal mass	..	...	...	...	109
Miscellaneous	72	450	106	95	146

TABLE 3.—*Therapeutic Procedures Recommended at Detection Examination*

Diagnosis	No.	Therapy Recommended	No.
Relaxation	325	Repair	159
Cervical cancer	17	Appropriate procedures	17
Myoma and adnexal masses	408	Laparotomy	169
Menometrorrhagia	277	Dilation and curettage	261
Cervicitis	1,633	Appropriate procedures	1,269

As will be indicated below, the follow-up also served to point out the limitations of the detection examination.

RESULTS

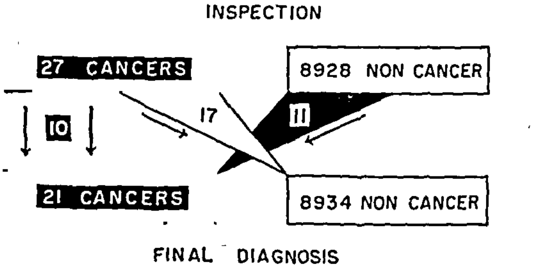
General.—Of the 8,955 examinees, 2,444, or 27.3%, were noted to have at least one positive abnormal finding in the pelvic. The examinees are classified in Table 1 as having cancer, major benign pelvic condition, minor benign pelvic condition, or no pelvic abnormality. A major benign pelvic condition implies a possible indication for a laparotomy or major vaginal procedure, while a minor benign condition implies a possible indication for a dilation and curettage, cauterization of the cervix, an office procedure, or the like.

Table 2 shows the abnormal conditions in the 2,444 persons with positive pelvic findings. The total abnormalities are greater than the number of patients, as 35% of those with positive pelvic signs had more than one abnormality. It should be noted that in this table the mere presence of an abnormality is not an accurate indication of its importance. The therapeutic or diagnostic procedures advised are a more accurate indication of a lesion's importance, and these are shown in Table 3. If no therapy was recommended for a disorder, the patient's general condition was such that treatment was not warranted (30 instances), the lesion was considered to be inconsequential, or active therapy was not indicated, as for an asymptomatic myoma.

External Genitalia.—In the United States there were 430 deaths due to vulvar carcinoma in 1947.[1] This death rate of 0.6 per 100,000 for all ages ranks next to that for vaginal carcinoma in infrequency.

No carcinoma of the vulva was found among the examinees.

The 41 examinees with leucoplakia of the vulva represent an important by-product of the examination as potential carcinoma patients. No important lesion of the vulva was uncovered in the followed group.



Value of inspection in diagnosis of cervical cancer.

Cervix.—Twenty-one examinees were noted to have cervical carcinomas. The condition of 17 of these was conclusively diagnosed at the detection center. In the remaining four cases conclusive diagnoses were made by the examinees' private physicians as a result of procedures suggested by the detection center examiners.

There were two International Stage III, three Stage II, 12 Stage I, and four Stage 0 lesions.

The discovery of two Stage III lesions in asymptomatic women serves to emphasize the importance of periodic pelvic examinations, as well as the complexity of the problem of public education.

All were epidermoid carcinomas except one Stage I adenocarcinoma.

The examiner expressed a clinical suspicion of carcinoma in only 10 of the 21 cases of proved cervical cancer. Carcinoma was *not* seriously suspected in the remaining 11. In addition to this, there were 17 other cases in which the examiner's note indicated that an early carcinoma was suspected, but in which the biopsy specimen showed no abnormality. In short, inspection, although important, is an unreliable diagnostic method for early carcinoma of the cervix (Figure). When pelvic examinations are made for this purpose, the examiner must be prepared to use other diagnostic aids.

Of special interest has been the frequent use of biopsy of the cervix, not as a method of confirming a diagnosis that can be made by inspection, but as an active aid in the diagnosis of early cancer of the cervix. Of the 8,955 examinees, 3,819, or 43%, had a biopsy. Some of these specimens were taken in one center where a biopsy of the cervix is a routine clinical research procedure.

It can probably be said that in our series no carcinoma has been found in a cervix that could be considered absolutely normal in every respect, although many have been discovered in cervixes with minimal abnormalities. Table 4 shows the results of biopsy. Follow-up of patients with basal-cell hyperplasia is most important.

The publication by Papanicolaou and Traut [3] in 1943 of their monograph on the diagnosis of uterine cancer by the vaginal smear has resulted in widespread use of and interest in this method of diagnosis. It has now been established as an accurate and useful diagnostic tool. According to Papanicolaou,[4] a staff consisting of two technicians, a secretary, and a pathologist is ideal for the examination of slides from 25 patients per day. It, therefore, becomes necessary to inquire whether a smear study will lead to the diagnosis of a substantial number of carcinomas that would be missed by standard diagnostic methods, including biopsy.

Table 4.—*Results of Biopsy (Detection-Center Specimen)*

	Number	% with Biopsy, Cervixes
Normal	1,221	32.0
Cancer	17	0.4
Cervicitis	2,513	65.8
Basal-cell hyperplasia	16	0.4
Not taken	5,136	....
Unsatisfactory	52	1.4
Total	8,955	....

Of the 21 persons with proved carcinomas of the cervix, only nine had a cervical and vaginal smear. Of these, one had Class II, five had Class III, and only three had Class IV smears.

Of the women with benign or normal cervical conditions, 4,138 had cervical and vaginal smears. Of these, 3,922 had Class I or II, 88 had Class III, and six had Class IV smears (Table 5).

All women with Class III and IV smears have had at least one negative biopsy specimen. Ten of these have had negative dilation and curettage. It is only fair to say that there may be a yet unproved carcinoma among the 102 with Class III and IV smears. Further follow-up of this group is most important.

Table 6 attempts to correlate the smear findings with the biopsy results.

Although the literature contains reports of patients with positive smears and negative biopsy specimens in whom a diagnosis of cancer was subsequently made, there has not been such a patient in this series.

Of special interest were the clues that led to the diagnosis of the four carcinomas in the examinees who had further procedures by their private physicians. Two of these examinees were seen early in the detection-center experience and presented menorrhagia, as well as abnormal cervixes. Biopsies and curettages were recommended and carried out by the private physician in each instance. At present each of these would doubtless have had both a smear study and a biopsy at the detection examination. The third patient had a cervical polyp removed at the time a Class III smear was obtained.

Table 5.—*Smear Findings (Detection-Center Specimen)*

Class	Number	% Cases with Smears
I	250	6.0
II	3,672	88.5
III	93	2.3
IV	9	0.2
V	0	0
Not taken	4,809	...
Unsatisfactory	122	3.0
Total	8,955	...

Because of the Class III smear, performance of a biopsy, which should have been done at the center, was suggested to the private physician. This was done by the examinee's physician and showed an intraepithelial carcinoma. The fourth patient had a Class II smear and a biopsy speciment showing basal-cell hyperplasia. Because of this, a repeat smear and biopsy specimen were obtained by her private physician. The smear was considered unsatisfactory, but the repeat biopsy specimen showed unmistakable intraepithelial carcinoma.

On the basis of experience with the present series, it may be said that one carcinoma would have been missed if biopsy had been reserved for Class III and higher smears. On the other hand, one Class III smear led to the biopsy of a cervix that was disregarded at the original examination.

There can be little doubt that the routine use of a smear study plus biopsy of abnormal cervixes results in the most comprehensive detection examination. However, smears are even now not generally available, and it is important to emphasize that in our series the smear method has not added statistically to the yield of cervical cancer. In short, it might be said that one can be a competent gynecologist even in the diagnosis of early carcinoma of the cervix without the benefit of a cytological service, provided there is no hesitancy in taking an adequate biopsy specimen of all abnormal-appearing cervixes.

Table 6.—*Results of Smear Study Plus Biopsy (Detection-Center Specimen)*

Results of Biopsy Class of Smear	Not Taken	Normal	Carcinoma	Cervicitis	Basal Hyperplasia	Unsatisfactory	Total
I	141	59	0	49	0	1	250
II	2,017	425	0	1,198	8	24	3,672
III	27	9	4	50	3	0	93
IV	1	1	3	4	0	0	9
V	0	0	0	0	0	0	0
Not taken	2,890	715	10	1,163	4	27	4,809
Unsatisfactory	60	12	0	49	1	0	122
Total	5,136	1,221	17	2,513	16	43	9

This discussion should not be interpreted as a criticism of the value of the smear as a dependable tool for a single method of screening the population, as used by Kraushaar, Bradberry, and Brown,[5] or Nieburg and Pund,[6] or as a criticism of its accuracy, which has been demonstrated in publications by Isbell, Jewett, Allan, and Hertig,[7] Scheffey, Rakoff, and Hoffman,[8] and in other studies, including the present report. However, when evaluated as an adjunct to the routine methods of pelvic examination, it becomes a less important procedure.

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[3] Papanicolaou, G. N., and Traut, H. P.: Diagnosis of Uterine Cancer by the Vaginal Smear, New York, Commonwealth Fund, 1943.

[4] Papanicolaou, G.: Personal communication to the author.

In view of the fact that study of a smear will sometimes reveal a carcinoma undetectable by biopsy, its routine use as part of a completely perfect detection examination is an ideal situation. It is clear that either a smear study or a biopsy of all abnormal cervixes must be done in any adequate detection examination.

It is interesting to note that the number of carcinomas of the cervix detected is about twice the expected incidence. In Table 7 the incidence rate is calculated from the data of Sadugar and Palmer.[9] This may indicate that an adequate detection examination will reveal most carcinomas that are destined to become symptomatic within the next two years or more. However, the possibility that the detection-center population is selected cannot be disregarded.[10]

Table 7.—*Cervical-Cancer Expectancy Among 8,955 Examinees, Based on Data of Sadugar and Palmer*[9]

Age	No. of Examinees	Incidence Rate per 100,000	Expectancy Cases
0-19	54	0	0
20-29	1,283	1.2	0.15
30-39	2,883	6.6	1.89
40-49	2,654	13.7	3.63
50-59	1,495	18.8	2.89
60-69	479	16.1	0.77
70-over	100	8.5	0.09
Unknown	7	...	....
Total	8,955	...	9.40

That an adequate detection examination implies the study of a smear or biopsy is emphasized by the follow-up study. One examinee who was considered well had clinical carcinoma of the cervix about six months after the detection examination. She was seen in the early part of the study and had neither a smear nor a biopsy specimen taken. It is possible, but in our opinion not probable, that this patient's condition was not detectable when she was seen.

Carcinoma of the Fundus.—In 1947 the death rate for carcinoma of the uterus in the United States was 24.1 per 100,000.[1] The incidence rate is obviously higher. Dorn[11] gives it as 54 per 100,000. If the ratio of deaths due to carcinoma of the fundus to total deaths due to uterine cancer is taken as 1 to 5, the incidence rate for carcinoma of the fundus must be about 10 in 100,000 for all ages. This means about 10,000 examinations for one fundal carcinoma, or somewhat fewer if the age factor is considered. Carcinoma of the fundus is not a detectable lesion by routine methods. It should be the field of greatest usefulness for the vaginal smear. Among the 8,955 examinees, two cancers of the fundus were found by curettage. These patients had a history of menometrorrhagia. At that time no smears were being taken. In 10 other patients dilation and curettage was done because of positive smears and negative cervical biopsy specimens, but to date no carcinoma of the fundus has been detected by this procedure.

If a smear is to be used as a diagnostic method for fundal carcinoma, one must be prepared to examine up to 10,000 smears from asymptomatic women for one positive case.

Ovary.—The ovary is second only to uterus as a site for fatal pelvic cancer. In 1947 carcinoma of the ovary accounted for 5.2% of all deaths due to cancer in females, with a rate of 7.0 per 100,000.[1] Among the 8,955 examinees, 109 had adnexal masses. Only 16 of these are known to have come to operation. The actual figure is probably higher, but in many instances at a subsequent examination the mass was found to have disappeared. Not one case of carcinoma of the ovary was found in the patients operated upon.

On the other hand, two women who did not have palpable adnexal masses and were considered well at examination had fatal ovarian cancer within six months. It must be concluded that the yield of operable ovarian cancers among asymptomatic women is very low and that fatal malignant ovarian growths may develop in spite of periodic pelvic examinations.

CONCLUSIONS

Cancer of the cervix is detectable in asymptomatic women by routine examination, provided biopsy and/or smear study of all abnormal cervixes is a part of the examination. Inspection alone is not a reliable diagnostic method for small carcinomas of the cervix.

In the experience reported on, with the use of an examination that includes biopsy of abnormal cervixes, the smear has not added statistically to the yield of detected cervical carcinomas. Both the smear study and the first biopsy may be considered to have missed one of the 21 cervical cancers found.

An ideal detection examination consists of smear study and biopsy of abnormal cervixes, in addition to history-taking inspection, and palpation. Any woman who has such an ideal detection examination with no abnormal findings may be reasonably sure that no clinically important cervical cancer will develop within six months, and perhaps longer.

Carcinomas of the fundus and ovary are seldom detectable in asymptomatic women, although the further investigation of minimal symptoms may result in the prompt diagnosis of lesions.

110 Medical Arts Bldg.

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ABSTRACT OF DISCUSSION

Dr. Herbert F. Traut, San Francisco: If there be any criticism of the methods, it probably can be directed only toward the follow-up. The assumption that cancer of the uterus does not exist after a single routine pelvic examination, augmented by biopsy and study of a vaginal smear, is not quite warranted. We do not yet know the exact value to place on such examinations. We know that negative findings are not as reliable as positive ones, but how many negative biopsy specimens or how many negative vaginal smears are necessary in order to rule out the presence of cancer has never been established. Follow-up by mailed questionnaires is not as satisfactory as one could wish, nor can the results as quoted by referring physicians be accepted in the same category as those made by an expert working in this field. The author concludes that the best possible procedure for revealing cancer of the uterus is a combination of the vaginal-smear study and biopsy. In this we are inclined to agree with him wholeheartedly. He says that the biopsy method alone has been found to be as reliable as the vaginal smear alone. With this we cannot agree, particularly in regard to the very early lesion. The biopsy method, as applied to the problem of cancer of the uterus and its therapy has been on trial and has been found wanting. The specialized cancer-detection center is an experimental phase that must be passed through. Thus far, we have found it to be an extraordinarily expensive means of discovering ovarian and uterine cancer in women. But ovarian and uterine cancer represents somewhat less than a third of the cancers to which women are heir. We must look through the low-power magnification rather than the high-power—look at the woman more as a whole than as a gynecologic patient, for half of her cancers will arise in the gastrointestinal tract, approximately one-fourth in the breast, and approximately one-fourth in the genital tract. The cancer-detection center should be a chronic-disease detection center and should be located in the local physician's office; the profession as a whole should be trained to this concept and be made competent to carry out the procedures that would reveal these various diseases. The laity must be taught that their health is as important as anything else they possess and that they must place themselves in the hands of their local physician at reasonable intervals—we suggest six months for parous women and twelve months for nulliparae—for the purpose of a general health examination, which would include, of course, the various examinations necessary for detecting cancer. The biopsy method of cancer diagnosis and the procedures of cytological nature, such as study of vaginal or cervical smears, constitute a somewhat expensive, skilled, demanding technic. Neither method is going to be satisfactory unless it is carried out in laboratories of high caliber, with good technicians and good diagnosticians. These must be made available, and to assume that they are available for the diagnosis of biopsy specimens is an inaccuracy. It will be some time before considerable numbers of diagnosticians will be available, but they are becoming available at a rapid rate, and the time will soon be here when all who need them may have the benefit of these two methods of cancer diagnosis under the best possible auspices. We would differ with the essayist as regards cancer of the fundus. The fact that he had only two instances of cancer of the fundus in his whole series is remarkable. That neither of these was found by vaginal smears would seem to indicate some fault in the technic or the experience in diagnosis.

Dr. Frederick H. Falls, River Forest, Ill.: The diagnosis of carcinoma of the uterus in a detection center is extremely important, but I believe detection centers are not the last word in finding carcinomas of the uterus and that the emphasis should be placed on the detection of carcinoma of the uterus in the physician's office. The cervical-smear reading is a technical feat that is not too difficult for ordinary technicians. It is up to the physicians to provide in each community a trained technician who can read these smears, and to assure in all cases in which suspicion of a carcinoma is aroused that smears are taken and submitted for examination. Soon after the Papanicolaou smear began to be applied to the diagnosis of carcinoma, I sent a man to work with Papanicolaou. After three weeks he returned, and we agreed to have him examine by smear all cases in which from the clinical standpoint we felt there was a carcinoma of the uterus. We did hysterectomies on these women. We found that whenever we felt clinically there was a malignant growth in a uterus the smear backed us up. That gave us faith in the smear method for diagnosis of uterine carcinoma. There is one condition that sometimes obviates the value of a smear, and that occurs in women past the menopause who have cervical strictures. Cervical strictures retain cells shed from the upper part of the cervix and the body of the uterus, and a carcinoma may be present for some time before its erosion destroys the cervix sufficiently to allow blood and discharge to come down into the vagina and be shown on clinical smear or by clinical symptoms. Therefore, in routine pelvic examinations, it is our custom to perform the so-called Clark test, in which a probe is passed through the cervix into the uterus. First, this procedure determines definitely that the cervix is patulous; secondly, if there is a lesion in the upper uterine tract, an abnormal amount of bleeding is caused by the invasion of the cavity with the probe. The vaginal smear in some cases may be positive in the presence of negative cervical and endometrial biopsy specimens. We have had two instances of this apparent paradox and in each case have found a carcinoma of the Fallopian tube. A negative biopsy report does not mean that there is no carcinoma in the cervix. We have seen positive and negative carcinoma sections obtained from the same block of biopsy material. The pathologist, therefore, is limited in his ability to help with the diagnosis of carcinoma by the sections that are presented to him for study.

Dr. Howard W. Jones Jr., Baltimore: I had requested that Dr. Traut be included as a discussant because I felt sure he would be the leader of the opposition. One of the discussants commented on the fact that the biopsy had been advocated for years and had been found wanting. I quite agree with him that the greatest advantage of a smear is that it is easy to take. I cannot agree that the biopsy is any less accurate than the smear study, particularly since one has to take into consideration the fact that there are some false leads from the smear. For example, in the nine cases of carcinomas that occurred in our smear era, only three showed Class IV smears, while at the same time there were six cases of Class IV smears in which repeated biopsies, smears, and dilations and curettages did not reveal the presence of carcinoma. If that is due to inexperience or difficulty in technique, it is because the average technician and the average cytologist cannot master the method, and, if the technique is too difficult to master, it is no good. The comment about the fundus is interesting, because if one estimates the incidence of fundal carcinoma in this series it turns out that there should have been exactly two cases of carcinoma of the fundus, which, in fact, was the number found. Therefore, I can make the same comment about carcinoma of the fundus as I can about that of the ovary, namely, that with current diagnostic methods the routine periodic pelvic examination is not a particularly valuable procedure. However, for detection of carcinoma of the cervix it is very valuable.

On the Road to a Life Worth Living.—Spectatorism is not much more than glorified idleness, whether it be at picture shows, athletic shows, or video. . . . *Activity,* planning, and ambition for leisure time leads to development of all the best potentialities of the individual; and achievement of success in the pursuits of one's own free choice is the source of true happiness. . . . There is one sure way to prevent frustration: it is substituting attainment for entertainment. It takes determination, enthusiasm, and civic, artistic and religious idealism to get the child started on the road to a life worth living.—Karl E. Kassowitz, M.D., Self-Expression and Self-Discipline: The Dualism in Education, *Wisconsin Medical Journal,* February 1951.

RESECTION OF VESICAL NECK IN CHILDREN

INDICATIONS AND RESULTS

T. Leon Howard, M.D.
and
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The development of children's urology was hampered by two totally different factors. The first, purely mechanical, was overcome by the fabrication of proper instruments, and the second and more important factor, the psychologic, was overcome by the realization of physicians that children do have urologic complaints for which proper diagnosis can be made and treatment given. Dr. Meredith Campbell's textbook "Pediatric Urology"[1] helped make many realize the psychologic importance of urologic disease in children.

The average physician is quite used to the patient with disease of the urinary tract who directs his complaints toward that field and is able to cooperate in simple examinations. The average urologist is also accustomed to a patient who has large veins and an adequate urethra and who can urinate at will. The child, on the other hand, frequently has small veins, urethral inadequacy, and inability to urinate at will. His symptoms may not be urinary, and collection of a specimen for urinalysis may be difficult. An excretory urogram may involve great physical and mental travail, and cystoscopy may be impossible without induction of general anesthesia, and perhaps then only after perineal urethrotomy. Because of these difficulties, the diagnosis in children is often wrong, and the child may be treated for years incorrectly.

A well equipped, well staffed hospital, such as the Children's Hospital, Denver, is of great value in solving the problems of pediatric urology.

The urologist's emphasis on the importance of early diagnosis will help the pediatrician toward earlier recognition of urologic disorders and will aid him in seeking proper treatment. The pediatrician's early diagnosis of urinary infection and the radiologist's demonstration of urinary retention are of little benefit, however, if the urologist's only treatment is administration of a new and different urinary antiseptic. Children's instruments are not an expensive addition to the urologist's armamentarium when one considers the satisfaction in preventing further urinary tract destruction in even one patient.

One more prejudice must be overcome: the theory that young children do not stand examinations or operative procedures well. This is entirely false, for children seem to have less reaction to the organic iodides than adults have and they rarely show any reaction to cystoscopy. Naturally, for long procedures an infant must be supported by intravenous therapy, or better by transfusion, but support is seldom necessary for operative cystoscopy. Cystoscopy, if indicated, can be done at any age. Ordinarily, the infant female urethra will accommodate the average child's cystoscopy, and the instrument can usually be introduced through the perineum in the baby boy. If this is impossible, the presence of an indwelling catheter for several days makes instrumentation possible. This fact we have proved on many occasions.

The lack of proper resectoscopes has been a major hindrance to the development of children's urology. A child's resectoscope, the Thompson, has been available only a decade, and many urologists refused to use it because of the visual system. Since recently a child's resectoscope with the familiar lens system was evolved and since many urologists are purchasing this, we thought an analysis of our patients seen since 1945 would prove valuable.

CLINICAL MATERIAL

The clinical material consists of 104 patients up to 14 years of age. Of these, 41 had resection of the vesical neck, and they are compared with 63 who had only dilation of the urethra. We have excluded from the group of resections those done for a frankly neurogenic bladder, and one which was done inadvertently on a patient with recurrent urinary infection due to obstruction in the lower ureter. In the series with dilation we have retained only patients thought to have contracture of the bladder neck. This excludes many patients with enuresis who were treated with fulguration of inflammatory areas, as well as those who were believed to have urethritis alone.

Dilation.—Our small series reveals little about age groups in general except to show at what age we are asked to see patients (table 2). It might be used for comparison with other areas to see whether the pediatricians are prompt in asking for consultation.

The largest amount of residual urine in this group was 140 cc. in a girl. Another girl with 120 cc. was the sister of a girl in the resection group. The one miscellaneous symptom was pain over the right kidney in a girl 6 years old. She proved to have slight caliectasis on the right, but a good result was obtained by bladder neck dilation. The damage was listed as slight, and there never was an increase in the nonprotein nitrogen. The one patient with reflux was a girl 5 years old who also had trabeculation of the bladder and slight dilatation of the upper urinary tract. These would be valid signs for resection, but the girl stayed clinically well after dilation, and the mother would not bring her in for further study. We have listed her among those with good results, for she has remained well more than two years, but of course we may have to place her in a different category in the future.

Results of Dilation.—Of these patients 49, or 77.78 per cent, have stayed well without the necessity of further treatments. (This result is not so good as it might appear, as 15 patients who were originally treated by dilation subsequently underwent resection; therefore, data on them do not appear in this table.) The other 14, or 22.22 per cent, have had further difficulties that required additional treatment, including repeated dilations in five. The records indicate clearly that two of these

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Read before the Section on Urology at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 28, 1950.

[1] Campbell, M. F.: Pediatric Urology, New York, The Macmillan Company, 1937.

patients need bladder neck resection, and probably the others do, too, in spite of the normal appearance of the bladder neck. Included in this group are four patients who had fulguration of the bladder neck as well as dilation. Although fulguration was done an additional five times, these patients eventually were subjected to resection. Sphincterotomy was done on a boy who also underwent resection. In other words, children with abnormal-appearing bladder necks seldom are permanently benefited except by resection.

Resection.—The age group distribution (table 4) again shows when the patients were sent to us for consultation. The number of boys over 11 years old is unusual. In two of these the symptoms had been present a long time, and marked upper urinary tract damage was present. In the other two, symptoms apparently developed at puberty. The urologic disorder of a 1 year old boy was accidentally discovered by a good diagnostician who saw the child because he had anemia. Further study revealed severe damage of the urinary tract with infection and elevation of the nonprotein nitrogen level. Fortunately a good result was obtained by resection. The cases of the two girls 1 year of age will be discussed in greater detail later.

Table 1.—*Sex Distribution*

	Resection		Dilation	
	No.	%	No.	%
Boys	16	39.02	9	14.29
Girls	25	60.98	54	85.71
Total	41		63	

Table 2.—*Ages of Sixty-Three Children Subjected to Urethral Dilation*

Age, Yr.	Boys	Girls
0-1	3	2
2-3	0	22
4-5	2	10
6-7	1	8
8-9	1	7
10-11	2	2
11 +	0	3
Total	9	54

Comparison of the percentages of signs and symptoms in these patients (table 5) with those given in table 3 reveals a striking difference. The miscellaneous symptoms consisted of anemia (probably a sign) in one patient and pain over the right kidney in a boy 13 years old; however, he had no demonstrable reflux or damage to the kidney. It is unfortunate that 33 patients had residual urine and 33 urinary infection, for this is not an identical group, as six patients with residual urine had no urinary infection and three of these had never had symptoms of urinary infection. Similarly, the group with a history of urinary infection and that with the finding of urinary infection are not as identical as the close numbers might indicate, for patients with a history of infection came to us with sterile urine and others without definite history of chills, fever and pyuria came to us with an infected urine.

This may seem a minor point, but we wish to emphasize the fact that all patients with urinary infection do not necessarily show comparable symptoms and that patients with residual urine and enough involvement of the bladder neck to justify resection can be relieved by treatment with modern urinary antiseptics. Frequently, it is the custom to call in the urologist only when urinary infection persists in spite of therapy or recurs frequently.

Table 3.—*Symptoms and Signs in Sixty-Three Patients with Dilation*

Symptoms	No.	%	Signs	No.	%
Urinary difficulty	20	31.74	Residual urine	7	11.11
Urinary infection	37	58.73	Urinary infection	10	15.87
Hematuria	7	11.11	Damage to upper urinary tract	10	15.87
Abdominal pain	5	.....	*Reflux*	1	.....
Enuresis	3	.....	Trabeculation	9	14.29
Enuresis and frequency or incontinence during the day	7	.....			
Miscellaneous	1	.....			

An illustrative case is that of a boy 4 years old who had had a serious urinary infection a year before we saw him. At that time he was cared for by a capable urologist who inserted an indwelling catheter and informed the family that the boy did not empty his bladder. However, he made no roentgenographic studies, nor did he suggest that anything be done about the residual urine. Since the boy had been well for a year without any medication, we suggested that there could be nothing seriously wrong. However, our studies showed pyelectasis and ureterectasis on the right and multiple diverticula, including one large diverticulum with an orifice near the right ureteral meatus. There was no reflux, and we believed the obstruction to the right ureter was secondary to the diverticulum. The bladder neck was resected, and after this the boy emptied his bladder. Soon after this he left Denver. Our hope that the kidney would improve was not justified, as recently nephroureterectomy was done.

We tend to forget the efficacy of modern urinary antiseptics, and that a child's recovery from a urinary infection with no recurrence for a year does not preclude the existence of serious obstructive lesions of the urinary tract. Improvement following dilation with later recurrence of symptoms is not an infallible indication that resection should be done; nor, on the other hand, is failure to improve a sign that resection should not be done.

Results of Resection.—The results were poor in 13 of the 41 patients (31.7 per cent) with resection. Two children, one boy and one girl, died. Both had serious damage to the upper urinary tract. Both did poorly after resection. The nonprotein nitrogen continued to rise, and physical development was faulty. Suprapubic tubes were inserted in both children; a nephrostomy was performed in one, and both died of renal failure. Among those with poor results we have included two boys with damaged upper urinary tracts and a permanent increase in the nonprotein nitrogen. Their conditions were quite similar, and a description of one will be presented later. One boy had a urethral stricture similar to that seen in adults

Table 4.—*Ages of Forty-One Children with Resection*

Age, Yr.	Boys	Girls
0-1	1	2
2-3	3	12
4-5	2	3
6-7	4	7
8-9	1	1
10-11	1	0
11+	4	0
Total	16	25

following resection; three have had repeated urinary infections, and two girls still complain of urinary difficulty. In one we can see no reason for this; the other has dysuria when she is constipated. More than one resection has been done in five, four of whom have already been mentioned.One boy had such severe urinary tract damage that suprapubic drainage was indicated. Three months later resection was performed, and since then the boy has done well. However, we still dilate the urethra under anesthesia from time to time, and, therefore, he is included in this group with poor results. One girl who had undergone resection previously elsewhere still had residual urine and urinary infection. We performed resection with the same results, and she is now under the care of a third urologist. The remaining 28 patients, or 68.29 per cent, have remained well.

Let us warn you of one pitfall in following children who have had resection. A child with a thickened bladder wall and a damaged upper urinary tract with reflux can void into his kidneys as easily as and sometimes more easily than through the urethra. Therefore, checks of the residual urine in this type of patient are worthless, as increasing renal damage can and does occur, in spite of the fact that the bladder is emptied by urination. Frequent estimation of the blood urea nitrogen must be done for such children to be certain that the improvement is real. This point is well illustrated by the case of the boy who died, for, in spite of the fact that he had no residual urine, damage to the upper tract was progressive.

Table 5.—*Symptoms and Signs in Forty-One Patients with Resection*

Symptoms	No.	%	Signs	No.	%
Urinary difficulty	18	43.90	Residual urine	33	80.67
Urinary infection	32	78.05	Urinary infection	33	80.67
Hematuria	2	.....	Damage to upper urinary tract	18	43.90
Abdominal pain	1	.....	Improvement following dilation	10	24.39
Enuresis	5	11.89	Reflux	11	26.83
Enuresis and frequency or incontinence during the day	6	14.63	Trabeculation	25	60.98
Miscellaneous	2	.....			

DIAGNOSTIC AIDS

When complete urologic investigation is necessary, we feel an excretory urogram should be done, and the films reviewed by the urologist. Of course, this approach is not always feasible. But in our experience attempts to proceed without urography have frequently resulted in poor diagnosis and treatment. We cannot stress too much the value of the excretory urogram in the management of children.

The method we use to check the presence of residual urine has certain advantages in children who may not be able to void at the desire of the physician. When such is the case, or at any time that there is a question whether residual urine exists, 1 ounce (29 cc.) of sterile liquid petrolatum is introduced into the bladder and the child is catheterized the following day. If liquid petrolatum is present, it is proof that the child has not emptied the bladder completely since the substance was introduced. The same method can be used for adults if desired.

The cystogram, and especially the cystogram made with the patient straining, is of great value in the management of bladder neck obstruction. The examinations that are not used frequently eough are urethrography and pyeloscopy. The former should be a routine procedure in dealing with bladder neck obstruction, and the latter a routine when the causation of ureterectasis is in doubt.

Cystoscopy remains one of the best diagnostic procedures. This can be done with local anesthesia if the child is well behaved. However, it is usually best done with the child under general anesthesia if there is a question of bladder neck obstruction, for it may be necessary to dilate the urethra, to view the bladder neck through different instruments and finally to resect if necessary. This can all be done under the same anesthetic. Our present practice is to start with the McCarthy miniature cystoscope, but, since this instrument at times (especially in the female) gives a poor view of the urethra, we frequently use other instruments. If the symptoms or signs indicate that resection is needed, the resectoscope is introduced. If after all this we are convinced that there is no obstructing tissue, the urethra is dilated with nos. 14 to 22 French catheters, depending on the size of the child. If bleeding follows this, an indwelling catheter is inserted for 24 hours. Should resection be decided on, this is done, and again a catheter is introduced for 24 hours. We find the nos. 12 and 14 Bardex catheters valuable for this. At the end of 24 hours the catheter is removed. In most instances the child voids properly and can be released from the hospital the following day.

REFLUX

The importance of reflux is shown by the fact that in our series only one child with reflux has not had bladder neck resection. In other words, the presence of reflux with bladder neck contracture is good evidence that resection should be done. However, two unusual types of reflux must be taken into account.

A young woman had a normal ureter and an obstruction at the ureteropelvic juncture. At operation nephrectomy was thought to be the treatment of choice. The ureter was tied with no. 1 chromic suture. The woman made an uneventful convalescence until six weeks later, when she was watching a ball game and drinking beer. Suddenly, she felt a severe pain in her right loin, and at surgery she was found to have the right retroperitoneal space full of urine from the stump of the ureter. The space was drained; the ureter retied, this time with silk, and she has had no further trouble. Obviously, this was reflux from bladder overdistention, which we know is not supposed to occur, but certainly did in this patient.

A child 6 months old had a functionless left kidney and a a normal right kidney according to excretory urography. The bladder and bladder neck were normal and only the left ureter was catheterized without difficulty while the child was under general anesthesia. However, the left ureterogram showed atresia of the upper ureter and reflux up the right ureter, with no overdistention of the bladder. A cystogram made on the child after he was awake showed no reflux. The condition of the child did not improve with dilation, and after the demonstration of reflux on straining, resection was done.

Naturally, this case belongs to a rare group. To demonstrate reflux we fill the bladder a reasonable amount and then have the child strain (if he is not already doing so) as though he were attempting to void.

A third type of reflux may occur because of abnormal ureteral peristalsis.

URETHRAL VALVES

We see little point in classifying various types of folds in the prostatic urethra as valves if the bladder neck must be resected to remove these folds. Instead, we prefer to include these in the total picture of contracture of the vesical neck. With this concept, there was but one patient who had a urethral valve. A 5 year old boy with enuresis, he was such a behavior problem that he was under a psychiatrist's care. After some time it was discovered that he had residual urine, and he was referred to us for cystoscopy, which showed a fibrous structure partially obstructing the prostatic urethra. This was engaged by the resectoscope with some difficulty, as it tended to wave back and forth, but once engaged it was excised. Aside from that nothing was done. The patient made a perfect recovery and has had neither urologic nor psychiatric troubles since.

UPPER URINARY TRACT DAMAGE

The damage to the upper urinary tract in this series ranged from none to irreparable destruction. A girl showed very slight damage represented by moderate pyelectasis and caliectasis. Dilation was first done at 6 years of age, but the patient was not relieved of her urinary infection, so resection was performed at the age of 10. After this the patient had no further urinary disturbance, but the mother insisted that the pyelograms be repeated until we considered the upper tract normal. It took 18 months for even this slight damage to be corrected, which should make us wary in predicting the disappearance of dilatation. Incidentally, this patient was the only one with an unusual pathological report on the tissue removed.

RESECTION OF APPARENTLY NORMAL BLADDER NECK

Resection in children when the bladder neck appears normal is a difficult problem. We wish to describe two examples of this. The first child presented an extremely stubborn condition.

The girl was first seen because of pyuria when she was 2½ years old. The child had a congenital dislocation of the hip, as well as a psychiatric behavior problem. She also took insufficient amounts of food and liquids for normal maintenance. At the original cystoscopy a suggestion that the bladder neck might be tight was entertained, but at all subsequent cystoscopies, and there were many, it was deemed entirely normal. After the original cystoscopy and pyelogram, the child made an uneventful recovery and her psychologic problem never recurred; but she had multiple recurrent urinary infections that were thought to be primarily in the left kidney.

Finally, on March 11, 1948, she entered the hospital with Pseudomonas bacteremia, with a similar organism in the urine, and was given streptomycin and sulfathiazole. During a hospital stay of 138 days she received a variety of urinary antiseptics, among them streptomycin, which at that time was considered the best for eradication of Pseudomonas aeruginosa. On June 4 treatment with mandelic acid was begun, and she had continued improvement until the mandelic acid therapy was stopped on June 26. On July 2, her temperature was 106 F. and the urine contained Staphylococcus pyogenes var. aureus and Escherichia coli. A no. 16 Foley catheter was placed in the bladder for continuous drainage, and her temperature came down satisfactorily. On July 13 the bladder neck was resected, and her course from then on was uneventful. She has remained well now for two years.

A boy 7 years of age when first seen complained of frequency and nocturia but had a negative urinalysis. On watching him void it was seen he had a weak dribbling stream, and by catheter he had 2 ounces (59 cc.) of residual urine. The excretory urogram was normal, but the cystogram showed slight reflux up the right ureter. The ureter appeared normal however. At cystoscopy, the bladder was not trabeculated and the bladder neck appeared entirely normal, so he was examined by a capable neurologist, who could find no neurological disturbance. Since his condition was unimproved by cystoscopy and dilation of the urethra to no. 16 French, the bladder neck was resected, with immediate relief of all urinary symptoms.

Such patients are not very common, but these examples are presented to show that bladder neck obstruction does exist at times in normal-appearing sphincters. In such cases the urologist should respect the bladder neck, in spite of the normal appearance.

The following case is that of one of the children over 11 years of age with unsatisfactory results.

This patient was first seen in November 1946 when he was 12 years of age, at which time his nonprotein nitrogen was 73.2 mg. per 100 cc., with a definite contraction of the bladder neck. When it was resected, Nov. 23, 1946, he had 500 cc. of residual urine. After this, he did well and the nonprotein nitrogen decreased to 42 mg. per 100 cc. of blood. In June 1947, the residual had increased to 5 ounces (148 cc.) and nonprotein nitrogen had increased to 60 mg. per 100 cc. Therefore, on June 25, 1947 additional tissue was removed. He improved, and in January 1948 the nonprotein nitrogen was 48 mg. per 100 cc. of blood. He left town and did not return to see us until October 1949, at which time he again had 5 ounces of residual urine and a nonprotein nitrogen of 92.5 mg. per 100 cc. of blood. His mother was written that further resection was indicated. In spite of this abnormal nonprotein nitrogen level the boy had developed normally, feels quite well and has no special complaints of any kind. We are certain that he has permanent kidney damage. It is quite remarkable to us that he empties his bladder at all, as the expulsive force is extremely poor.

BEHAVIOR PROBLEMS

It has been mentioned in the discussion on several of the patients that they were under he care of a psychiatrist, and many more in the group had definite psychologic problems. Without exception, when the urethra was dilated, these improved and in most cases were permanently relieved. We do not wish to convey the impression that all child personality problems are a result of bladder neck dysfunction, but we do wish to call attention to this possibility and to stress the desirability of examination of the urine.

BILATERAL URETEROCELES

In one of the patients with a poor result following resection because of recurrent urinary infection, the original urinary difficulties were due to bilateral ureteroceles, which were opened in January 1946. The boy did well until the summer of 1948, when there was recurrent urinary infection. On cystoscopy the ureteral meatus appeared entirely normal, but there was 500 cc. of residual urine. Thinking this residual might be due entirely to the urinary infection, the patient was given chemotherapy, but he did not improve until a bladder neck resection was done on July 14, 1948. At that time the child was at puberty, which we thought might be a factor. Since then he has developed well but continues to have recurrent urinary tract infection.

A second patient had the same complication, that is, bilateral ureteroceles with bladder neck obstruction at puberty. The pyelograms taken before the ureteroceles were opened demonstrated that this boy's upper urinary tract was badly damaged. After they were opened the boy had no urinary troubles until recently, when recurrent infection developed. The bladder neck was resected, but too recently for the result to be included in the paper or to determine whether permanent relief has been obtained.

UNUSUAL SYMPTOMS

We have mentioned some of the unusual symptoms but wish to present those of one 5 year old girl in detail.

This patient's complaints were not of urinary disturbance but of convulsive seizures, for which she had been studied thoroughly at the age of 3 years. She was returned when she was 5 with the same complaints, but this time her pediatrician happened to watch her try to void for a specimen and suddenly realized that the "seizures" were in reality only the child's efforts to void.

A cystogram made after voiding showed residual urine and demonstrated that there was no reflux even after five years of intense straining. The upper urinary tract was normal, and the child made an uneventful and permanent recovery.

The same day this child underwent resection another patient was subjected to the operation. She was 2 months old and had suffered urinary difficulty and infection since birth. The cystogram showed marked trabeculation with reflux and destruction of the upper urinary tract. The baby also had a congenital deformity of the rectum, which appeared in the middle of the perineum through a very tight opening. The dilatation of the bowel was thought to be on an obstructive basis. At the same time the bladder neck was resected this other abnormality was corrected, and the rectum dropped back to its normal location. From that time the child had no further bowel disturbance. She also voided well; the urinary infection was controlled; the nonprotein nitrogen dropped from 66 to 39 mg. per 100 cc. of blood, and the child was dismissed. She was returned three months later because of failure to keep up her weight and was found to have a serious yeast infection of the urinary tract. This was controlled with great difficulty, and again the child was dismissed. She was returned again four months later with the history of urine leaking out the umbilicus and an inability to gain weight. Because we believed the bladder neck had been thoroughly resected, but also because we believed the breaking open of the urachus was positive proof that the bladder neck was not functioning properly, a suprapubic tube was inserted, but the baby died soon afterward. The postmortem picture revealed that grossly all the obstructing tissue had been removed from the urethra, but again the thick, trabeculated bladder and dilated upper tract showed that the bladder was not functioning properly. Lengthwise sections through the urethrovesical juncture failed to reveal the nature of this dysfunction. The large bowel was normal.

The contrast between these two patients, one straining for five years without damaging her kidneys, and the other wrecking her upper tract within the first few months of life, is illuminating.

SUMMARY

A group of children are presented who have been treated either by simple dilation of the urethra or by the actual resection of tissue from the bladder neck. The statistics show that patients with marked symptoms and signs are more liable to need resection, and that boys are affected oftener than girls, but striking exceptions are noted. Difficulties in diagnosis and examination are discussed.

CONCLUSIONS

Resection of the vesical neck in either boys or girls is a worth while urologic procedure and should be performed when indicated, even though the bladder neck appears normal. This can be considered a minor operation with no operative mortality and usually requires a short postoperative hospitalization, ordinarily less than 72 hours. The absence of residual urine is not necessarily a sign that the operative procedure has been a success and that the child will remain well and develop properly.

ABSTRACT OF DISCUSSION

Dr. Miley B. Wesson, San Francisco: It is appropriate that this excellent paper of Drs. Howard and Buchtel should be presented in the home town of Dr. William E. Stevens, who, for over 40 years, has pioneered the study of the female urethra. *It has been 28 years since the late Franklin P. Johnson* published his embryological research, "The Homologue of the Prostate in the Female" (*J. Urol.* 8:13, 1922), but it was not until 1936 that David Mackenzie and Hugh Cabot made studies independently of the histopathology of the female bladder neck and urethra. Now, 14 years later, thanks to the mechanical ingenuity of Fred Wallace, Dr. Howard and his associates have been able to complete the study. Mr. Wallace recently showed me a baby telescope, with a large field, that would fit into the irrigating sheath of a no. 4 or 5 French catheter. When this is on the market, there will be no further difficulty in cystoscopy in baby boys. From now on, we will hear only about what not to do. The resectoscopist must never forget that the element of safety in cutting a female bladder neck is very small. He must be thoroughly familiar with the anatomy and also with Dr. Henry Weyrauch's findings on the depth of tissue destruction from cuts made with a spark gap current. Dr. Bentley Squier throughout his life referred to such treatment as burning, cooking or frying of tissues. I would like to report briefly the story of a 4 year old martyr to the electric current. She had a vesicourethrovaginal fistula. There had been difficulty in voiding and often residual urine of 1,500 cc. A diagnosis was made of a median bar with a muscular flap that acted as a cork, and on two occasions thorough fulguration was done. Retention was replaced by incontinence, and the family was instructed that nothing further could be done until the child was 16. After three unsuccessful repairs, one by that master technician, Dr. Guy *Hunner, I was able to close the opening, and at 14 she celebrated* her escape from bondage with a bonfire of all of her rubber pants.

Dr. A. M. Meads, Oakland, Calif.: My experience in treating lesions of the vesical neck in children is fairly limited. In my hands recurrent infections in the bladder have improved after dilation with sounds, showing that a contracted bladder neck or some simple type of obstruction in children does respond often to simple treatment. Personally I have not resected transurethrally any tissue in infants, but I have destroyed by fulguration obstructing bars and valves through a small cystoscope. This is safer where the urethra is very small. I have excised larger obstructions through a suprapubic incision with no regret in the few cases that I have seen. I purchased a small resectoscope two years ago, but I must confess that I have not used it, as I am still waiting for what I consider a proper case for such a procedure. I have seen a few young men and women of college age in whom a transurethral resection was indicated, but in these cases various degrees of hydroureter and hydronephrosis had already developed. This paper of Drs. Howard and Buchtel gives me food for thought. If these young adults had been treated in infancy, the extensive damage seen later could have been prevented. Most obstructive lesions seen in children are due to developmental defects and cannot be prevented, but early diagnosis and early removal of the obstruction could prevent the later damage. The small urethra in the very young must be dilated before a resectoscope can be passed. This dilation in itself is therapeutic. The small amount of tissue removed resectoscopically, in some reported cases, seems out of proportion to the spectacular improvement, unless the dilation has something to do with it. It is my custom when a distinct tumor mass is present (in one case a fibroma) to excise the mass through a suprapubic approach. I thus avoid the possibility of incontinence or damage to the bladder base. I can see a place for transurethral resection in children, but, as I treat comparatively few children, I have still not had an occasion to do one. The experience of Drs. Howard and Buchtel as given here today in their excellent paper will influence many of us, I am sure, in deciding when the resectoscope should be used in children.

Dr. Henry A. Buchtel, Denver: I should have mentioned that the vast majority of operations are done with the Thompson baby resectoscope. I think that is much the safest instrument, especially in a girl, because with the instrument you can remove exactly the tissue you wish to remove without the danger of sloughing or further injury afterward.

ADULT FORM OF CHRONIC PORPHYRIA WITH CUTANEOUS MANIFESTATIONS

REPORT OF SEVENTEEN ADDITIONAL CASES

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and
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The symptoms and laboratory features of chronic or intermediate porphyria may be similar to those of either the acute or the congenital forms, although the course is milder, as a rule. A blistering reaction of the exposed skin of adults, especially on the dorsa of the hands, in response to light, heat, or minor trauma is usually the first manifestation of this disease. The complexion assumes a dusky, bluish-red hue; the conjunctivae are injected, and hypertrichosis may occur. Other symptoms of a vague nature relating to the gastrointestinal system may occur, or nervous and mental disorders may develop. A familial incidence has been noted.

The factors which may contribute to the development of the manifest phase of porphyria are not well understood. In so-called acute idiopathic porphyria the barbiturates have long been incriminated. In chronic porphyria a damaging influence on the liver, either by disease, such as cirrhosis, syphilis, diabetes, or chronic amebiasis, or by hepatotoxic drugs or poisons, such as arsenic and particularly alcohol, seems to offer the precipitating insult. A number of examples have been reported.[1]

In this connection, one must distinguish between cases in which porphyrinuria accompanies hepatic dysfunction and those of true porphyria with jaundice or other involvement of the liver. In the former, there is no familial disposition and no ether-insoluble porphyrin is excreted. Gray, Rimington, and Thomson[2] described the case of a man 20 yr. of age, the skin of whose face and hands first became blistered in response to exposure to sun and to trauma; later, attacks of severe abdominal pain appeared, the earliest and severest of these being associated with jaundice. Initially, during the periods of sensitivity to light and abdominal attacks, the urine contained large amounts of porphyrins, including an ether-insoluble porphyrin, distinct from the known types of uroporphyrin and not yet identified. Between episodes, the amount of porphyrins in the urine diminished and increased in the stools; later, even these amounts gradually lessened as the clinical phase of the disease subsided.

Recently the occurrence of acute porphyria in three cases of diabetes was reported by Sterling, Silver, and Ricketts.[3] The diabetes had been of from three to 20 years' standing. No skin lesions were present. The occurrence of fatty infiltration of the liver in diabetes may offer a remote clue to the reason for the association of the two diseases, given a person with a suitable genetic background.

The symptoms of porphyria are complex; with an increased threshold of suspicion in this direction more instances of the disease will be recognized. Chronic porphyria, at least the type with cutaneous manifestations in adults, is commoner than is generally supposed; in the comparatively short period of the past five or six years we have observed 21 patients in whom the characteristic features of the disorder were brought to our attention by signs first appearing on the skin. Data concerning four cases have been reported previously.[1a,b]

This report is based on study of the 17 additional cases, of which two were chosen to be presented in order to illustrate briefly important factors of the disease. A discussion of the porphyrins involved (Table 1), the cutaneous and other aspects of the syndrome and the precipitating influences in the 17 cases (Cases 1 to 17) in particular will be considered.

REPORT OF CASES

CASE 2.—A man aged 46 yr., a butcher and farmer from Minnesota, came to the Mayo Clinic in the summer of 1949 because of a blistering eruption of the hands of five weeks' duration. Any relation to sunlight had not been noticed. After minor injury to his hands in his work, abrasions would form and, later, blisters which, when ruptured, were slow to heal. He also complained of loss of "pep," dating from a respiratory infection one year before. Since then his eyes had been bloodshot. At one time, 10 yr. previously, he had weighed 215 lb. (97.5 kg.), but by curtailing his beer drinking he had reduced his weight in two years to 160 lb. (72.6 kg.). He still used beer and as much as 1 pt. (473 ml.) of whisky on his monthly "binge." He had never noticed red urine.

Examination revealed that the weight was 154 lb. (69.9 kg.) and the blood pressure 126 mm. of mercury systolic and 90 diastolic. The exposed skin of the face and upper part of the trunk was a dusky, erythematous hue. Around the eyes the skin was colored bluish pink. There were irregular pigmented and depigmented areas about the face and neck. The cheeks had a waxy cast. The conjunctivas were injected, and the eyes had a rheumy appearance. The skin of the backs of the hands was hyperpigmented, with small irregular spots of colorless skin which were pink and showed telangiectasia. Over the dorsa of the hands and along the sides of the fingers there were a few small vesicles and crusted erosions of previous lesions of the same sort. Biopsy of the skin of the right preauricular area revealed microscopic evidence of dermatitis of nonspecific character.

Read before the Section on Dermatology at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 28, 1950.

From the Section on Dermatology and Syphilology, Mayo Clinic (Dr. Brunsting); the Division of Biochemistry, Mayo Foundation (Dr. Mason), and the Section on Pediatrics, Mayo Clinic (Dr. Aldrich).

[1] (*a*) Brunsting, L. A., and Mason, H. L.: Porphyria With Epidermolysis Bullosa; Report of a Case of the Tardive Congenital Type With Demonstration of Latent Porphyria in a Sister of the Patient, J. A. M. A. **132**: 509-513 (Nov. 2) 1946. (*b*) Porphyria With Cutaneous Manifestations, Arch. Dermat. & Syph. **60**: 66-81 (July) 1949. (*c*) Hübner, K.: Porphyrinuntersuchungen bei einer Gruppe von Dermatosen, Arch. f. Dermat. u. Syph. **180**: 289-290, 1940. (*d*) Szodoray, L., and Sümegi, S.: Über die Nosologie der chronischen kutanen Porphyrie, Dermatologica **90**: 224-232, 1944. (*e*) Borda, J. M. C.: Porfirinas y porfiria: consideraciones especiales sobre clínica y classificación de dermatosis porfiricas, Buenos Aires, Lopez & Etchegoyen S. R. L., 1946, pp. 41-68. (*f*) Gomez Orbaneja, J., and Castro Mendoza, H.: Dermatosen und Porphyrie, Dermatologica **94**: 327-334, 1947. (*g*) Zeligman, I., and Baum, M.: Porphyric Bullous Dermatosis, Arch. Dermat. & Syph. **58**: 357-369 (Oct.) 1948. (*h*) Schuppli, R.: 4. Porphyrie mit Bullosis actinica und Mechanica, Dermatologica **98**: 346, 1948-1949.

[2] Gray, C. H.; Rimington, C., and Thomson, S.: A Case of Chronic Porphyria Associated With Recurrent Jaundice, Quart. J. Med. **17**: 123-137 (April) 1948.

[3] Sterling, K.; Silver, M., and Ricketts, H. T.: Development of Porphyria in Diabetes Mellitus: Report of Three Cases, Arch. Int. Med. **84**: 965-975 (Dec.) 1949.

Laboratory tests revealed only slight evidence of hepatic dysfunction. The urine showed primary fluorescence under the Wood light. Quantitative estimations of porphyrins are listed in Table 1. Porphobilinogen was not demonstrated. Fluid from blisters on the skin of the hands, a total of about 2 cc., was examined for porphyrins, and the results were negative.

The violaceous color of the skin brought up the possibility of polycythemia, but the values for hemoglobin and erythrocytes were within normal limits. The cell volume (hematocrit) measured 50 to 52%. Spectroscopic examination of the blood showed no indication of sulfhemoglobin or methemoglobin. There was no indication on physical examination of systemic or pulmonary hypertension.

The patient was observed at intervals for nine months as he followed his instructions regarding diet and total abstinence.

TABLE 1.—*Quantitative Urinary Porphyrins, Mg. per Twenty-Four Hours, in Adult Form of Chronic Porphyria with Cutaneous Manifestations*

Case	Date	Uro-porphyrin	Copro-porphyrin
1.	....	0.16[*]	0.846[*]
2.	1949	6.57	1.27
	....	5.92	1.3
	....	1.21	0.218
	....	6.66	1.08
	1950	5.34	.....
3.	1949	4.17	0.825
	....	1.91	0.374
	1950	....	0.206
4.	....	Excess	Excess
5.	1946	....	0.95
	1948	8.06	7.25
6.	1948	11.2	2.7
	....	12.2	2.4
	1949	3.56	1.61
	1950	8.24	0.77
7.	....	22.4	3.9
	....	16.4	3.6
8.	1948	6.8	2.3
	....	6.3	1.8
	....	4.5	1.6
	....	1.4	0.47
	1949	0.725	0.222
9.	1948	6.6 [†]	1.93
	....	0.51	1.31
	1949	....[†]	1.69
	1950	....	0.218
10.	....	....	0.635
	....	....	0.485
11.	1947	....[†]	.....
	1949	....	.....
12.	....	1.121	3.0
13.	....	0.448[†]	1.165
14.	....	....[†]	1.6
	....	....	0.692
15.	1949	6.9	0.992
	1950	8.039	0.304
	....	9.974[‡]	1.205
16.	1949	6.25	1.33
	1950	12.75	0.274
17.	....	2.065	0.332

[*] 200-ml. sample.

[†] Test for porphobilinogen slightly positive.

[‡] Zinc complex of uroporphyrin: absorption maxima, 540 and 578 mμ; melting point of methyl ester, 258-260 C.

The blistering appeared and disappeared without regard to exposure of the skin to the sun, and the skin of the hands continued to be vulnerable to slight trauma. There was difficulty with shaving because of the tough beard and the tender skin of the face. After a period of six months, no more blisters developed although the skin over the knuckles was frequently abraded in the patient's work as a butcher; the color of the skin of the upper part of the body and the face remained unchanged.

CASE 15.—*A widow aged 64 yr., from Michigan, came to the clinic in December, 1949, because of a blistering eruption of the hands and fingers of six months' duration, which had been called "pemphigus."* In June a few pea-sized vesicles had first appeared over the backs of the index fingers; these exuded a clear fluid when ruptured and would form small ulcers which became crusted and sometimes infected; they healed slowly within two or three weeks. Repeated crops of such lesions appeared off and on during the summer months, without noticeable relation to sunlight, at first on the fingers and hands and later on the forearms and the ankles. Toward the winter months the process tapered off. Over the preceding two or three years, the patient and her family had noted a darkening of her complexion, as though she were wind-burned, and a considerable growth of hair had appeared on the face. During this interval the urine frequently had been tinted pink. There was no history of abdominal cramps. There was no similar skin condition in other members of the family.

The patient recalled that between the ages of 20 to 40 yr. she had had a recurring eruption of a different sort in which papular lesions had appeared for a short time each spring on the exposed surfaces of the skin. She remembered having taken arsenic intermittently for 10 yr. as part of the treatment for this disorder; instead of taking the prescribed number of drops of the medicine each day, she had taken a teaspoonful (4 to 5 ml.) without ill effect at the time. When she was 50 yr. old the papular eruption had recurred briefly.

For one year, at the age of 54 yr., she had been confined under psychiatric observation because of a reactive depression which had come on after her husband's suicide. After a series of shock treatments, she seemingly recovered and resumed her premarital occupation of teaching school, which she had continued without interruption until the time of her examination. The use of alcoholic drinks was denied.

Physical examination in December 1949 revealed abnormal conditions in the skin and the liver. The skin of the exposed surfaces of the face and neck was of a dusky, cyanotic hue and hyperpigmented. The conjunctivas were injected. There was hypertrichosis of the face. On the dorsa of the hands and fingers diffuse melanosis and a few crusted lesions, scars, and milia were evident. The liver was palpable 6 cm. below the costal margin. The weight was 135 lb. (61.2 kg.); the blood pressure was 130 mm. systolic and 76 diastolic. Dental examination revealed a severe degree of pyorrhea. The sulfobromophthalein test for liver function showed a 26% retention of the dye (Grade 3); there was no direct-reacting and 1.2 mg. of indirect-reacting bilirubin per 100 cc. of serum. Routine urinalysis showed normal urine. By Wood light the urine showed a strong primary fluorescence. The urine revealed large amounts of uroporphyrin and coproporphyrin, but tests for porphobilinogen were negative (Table 1).

Three months later, the patient returned. In the meantime she had followed a dietary regimen for cirrhosis. The infected teeth had been removed. Headaches and a state of mind similar to that of her depression of 10 yr. before had developed gradually. Her condition was characterized by lack of interest, hopelessness, suicidal trends, and insomnia. She had taken various forms of sedatives without relief. There had been no blisters, but the skin of the hands was easily traumatized.

Examination showed the same bluish-pink complexion as before. There were no recent excoriations on the backs of the hands and only a few scars and milia. The sulfobromophthalein test for liver function showed a 12% retention of the dye (Grade 2). The urine, which was tinted pink, contained large amounts of abnormal porphyrins. The porphyrins were present in the form of the zinc complex as determined spectroscopically with absorption maxima at 540 and 578 mμ. The Waldenström uroporphyrin was isolated, the melting point of the methyl ester being 258 to 260 C. No porphobilinogen was present. Psychiatric studies indicated a severe degree of reactive depression, and sanitarium management was advised.

Further examinations to indicate the nature of the hepatic dysfunction were not revealing. The urine showed no evidence of arsenic. Glucose-tolerance tests showed a diabetic type of response, but, in the absence of glycosuria and with a normal fasting level of blood sugar, this was interpreted as probably being related to the state of the liver.

Special studies were undertaken to determine the cause of the peculiar cyanotic hue of the exposed skin, without success. Both arterial and venous blood pressures were within normal limits. By manometric measurement, the oxygen saturation of the arterial and venous blood under various conditions of rest and exercise and with the inhalation of oxygen was found to be within normal limits. There was no evidence of polycythemia. Because of the hue of the skin and the presence of hypertrichosis, the possibility of Cushing's syndrome was considered briefly, but observations were not confirmatory. The blood pressure was normal. The roentgenograms of the skull revealed nothing abnormal. Concentrations of 17-ketosteroids and cortin-like substances in the urine were low on two separate occasions.

There was no record of a similar disorder in other members of the family; a sister, who accompanied the patient, appeared to be of normal health, and on two separate occasions her urine was examined and found to be free from abnormal porphyrins.

PORPHYRINS

Strictly speaking, the diagnosis of porphyria is established by the demonstration of uroporphyrin or the colorless chromogen porphobilinogen in the urine. Uroporphyrin is a porphyrin which appears abnormally, presumably as the result of the disturbed pyrrole metabolism of this disease. The urine contains a much higher concentration of uroporphyrin than do the feces and is more readily obtainable for laboratory analysis.

The presence of uroporphyrin in the urine is common to all types of porphyria. However, the form in which it is excreted may differ in the various clinical types. For example, the porphyrin in the urine of adults suffering from the acute intermittent form of porphyria is largely excreted as the zinc complex, but in children who have the so-called congenital form of porphyria the porphyrin appears in the urine in the free state. It is not possible at present to separate the clinical classes of porphyria on the basis of laboratory studies of the urine and feces alone. Nevertheless it is important that detailed information be recorded concerning the porphyrin metabolism in each case so that a better understanding of the abnormal metabolic processes may develop.

We would like to stress the wide variation in the appearance of the freshly voided urine. It is customary to speak of porphyric urine as being red or port wine in color; this observation was by no means the general rule in our cases. In some cases the specimen was almost normal in color, varying in shade from light yellow to dark amber. On the other hand, some samples were distinctly red. Thus, when porphyria is the suspected diagnosis it is probably unwise to discard a sample of urine because it is not red without first performing qualitative laboratory tests for uroporphyrin and porphobilinogen. Not all the discoloration seen in porphyric urine is due to the porphyrin itself. The urine contains other pigments which are not porphyrins but which probably are related as a result of the disturbance in pyrrole metabolism. Little is known about these pigments although, according to Garrod,[4] they were first emphasized by Hammarsten in 1891.

Qualitative Procedures for Identifying Uroporphyrin in Urine.—The quality of primary fluorescence in the near-ultraviolet region of the spectrum is an outstanding characteristic of the urine of children with so-called congenital porphyria. Although this phenomenon may occur in other forms of porphyria, it is often masked by the presence of other pigments or by the formation of a porphyrin complex with a metal such as zinc. A useful method for the qualitative identification of uroporphyrin in the urine has been described by Brunsting and Mason.[1b] An improvement [5] has been recently tried by one of us (Aldrich [6]) which makes use of the solubility of both uroporphyrin and coproporphyrin in an equal mixture of normal butyl alcohol and ethyl acetate. The bulk of the urinary impurities are separated from the porphyrin in the first step and left in the aqueous phase. This procedure is as follows:

> Shake a sample of fresh urine which has been acidified with a few cubic centimeters of glacial acetic acid in a separatory funnel with an equal volume of the 1:1 mixture of normal butyl alcohol and ethyl acetate. Discard the aqueous phase after it has completely separated. Wash the normal butyl alcohol-ethyl acetate mixture with three portions of distilled water. The organic-solvent layer will have a red fluorescence in the near-ultraviolet region of the spectrum. Then extract with small (3 to 5 cc.) portions of 10% sodium hydroxide; the porphyrins appear to go into the alkali almost quantitatively. Discard the normal butyl alcohol-ethyl acetate mixture and neutralize the sodium hydroxide with hydrochloric acid until the solution turns Congo red paper gray. Add 1 to 2 cc. of glacial acetic acid, and shake the solution with an equal volume of ether. Coproporphyrin goes into the ether, and if uroporphyrin is present it will remain behind in the aqueous phase. If large amounts of porphyrin seem to be present the ether extraction can be carried out several times to insure removal of all coproporphyrin from the water layer. Acidify the aqueous portion with hydrochloric acid, and examine it for red fluorescence in the light beam of the Pfalz and Bauer fluorophotometer equipped with a filter (Corning 5113) which gives the incident beam a strong intensity in the near-ultraviolet region of the spectrum.

Porphobilinogen.—Watson and Schwartz [7] described a qualitative method for the determination of porphobilinogen in urine. A rough estimate of the amount of porphobilinogen present can be made by use of a procedure described previously.[1b]

Spectroscopic Examination of Urine.—Examination of the fresh urine with the spectroscope will usually reveal whether the porphyrin is present in the free state or as the zinc complex. This complex may be formed with either the uroporphyrin or coproporphyrin. The zinc complex has strong absorption maxima at 537 and 578 mμ. If hydrochloric acid is then added to the sample, a change occurs in the absorption spectrum, and the maximal absorption then will appear at 550 and 594 mμ.

Quantitative Determination of Coproporphyrin and Uroporphyrin in Urine.—The method of Mason and Nesbitt [8] for determination of coproporphyrin was used in the study of our 17 patients. Quantification of uroporphyrin is difficult. Present methods give only a rough estimate at best. The problem is further complicated by the recent observation of British investigators,[9] who pointed out that the amount and character of the uroporphyrin in urine may be changed considerably by certain types of pretreatment of the specimen. The quantitative data reported herein were obtained by a method described in 1946.[1b]

Crystallization of the Porphyrin Methyl Esters From Urine.—Uroporphyrin octamethyl ester was prepared from the urine in only 1 case (Case 15) in the present series. The method used has been described elsewhere.[10]

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[4] Garrod, A. E.: A Survey of the Recorded Cases of Haematoporphyrinuria Not Due to Sulfanol, Tr. Path. Soc. London 55: 142-151 (March 1) 1904.

[5] This principle was suggested by Dr. Samuel Schwartz, Department of Medicine, University of Minnesota, Minneapolis.

[6] Aldrich, R. A.: Unpublished data.

[7] Watson, C. J., and Schwartz, S.: Simple Test for Urinary Porphobilinogen, Proc. Soc. Exper. Biol. & Med. 47: 393-394 (June) 1941.

[8] Mason, H. L., and Nesbitt, S.: A Method for the Determination of Coproporphyrin in Urine, J. Biol. Chem. 152: 19-25 (Jan.) 1944.

[9] Gibson, Q. H., and Harrison, D. C.: A Note on the Urinary Uroporphyrin in Acute Porphyria, Biochem. J. 46: 154-157 (Feb.) 1950.

Observations in Seventeen Cases (Table 1).—Fourteen of the patients in our group were shown to have uroporphyrin in the urine on one or more occasions. In three cases in which two or more examinations were made for urinary porphyrins, uroporphyrin was absent on at least one occasion. This suggests that the excretion of uroporphyrin in this type of case may be intermittent. The urine of five of the 14 patients was examined for the porphyrin zinc complex, which was found to be present. Uroporphyrin octamethyl ester was crystallized from the urine in two cases and melted at 258 to 260 C. in one instance and at 273 C. in the other. This property is characteristic of the so-called Waldenström porphyrin. Evidence has been presented that this is a mixture of uroporphyrin I and an as-yet-unidentified urotype porphyrin.[11] The presence of the Waldenström porphyrin in urine has been considered a main feature of intermittent acute porphyria in which there is not dermal photosensitivity. Observation of this porphyrin in the urine of a patient who presented dermal photosensitivity emphasizes the present difficulty of classifying this form of porphyria on the basis of laboratory results alone. The quantity of uroporphyrin excreted per 24 hr. ranged from 22.4 to 0 mg.; most of the values fell in the range between 1 and 7 mg.

Each specimen was tested for porphobilinogen, and it was found in the urine of five patients. No uroporphyrin was demonstrated in the urine of two of these patients (Cases 10 and 14), while the urine specimens of the other three were positive for uroporphyrin. The colorless chromogen, porphobilinogen, was considered by Waldenström to be a characteristic observation in the urine of patients with acute intermittent porphyria and is not present in the urine of children with congenital porphyria who have skin photosensitivity.

Coproporphyrin was quantitatively elevated in 16 of the patients, but the relative proportions of the two coproporphyrin isomers I and III were not determined. Increased excretion of urinary coproporphyrin is the rule in porphyria; this is also a common observation in certain types of liver disease.[12] The amounts excreted in hepatic disease are usually much less than the values found in these patients. However, it is impossible to ascertain the relative proportion which the two pathologic conditions contributed to the high levels observed.

One of the patients in this series (Case 10) excreted neither uroporphyrin nor porphobilinogen on the two occasions when the urine was examined. The levels of coproporphyrin were well above normal. This person is included in the series because of the typical clinical picture of porphyria and because we believe that subsequent specimens of urine may be positive for either porphobilinogen or uroporphyrin, this case thus conforming to the intermittent behavior seen in others mentioned above.

Therefore we may conclude that in this series of patients the laboratory observations referable to porphyrin metabolism present some of the features of both congenital porphyria and acute intermittent porphyria. This conclusion agrees with the clinical picture, which is also one of a mixed type of porphyria.

CHANGES IN THE SKIN

Changes in the skin of patients with chronic porphyria involve the complexion and the dorsal surfaces of the hands. Diffuse melanosis of the exposed skin and hair, as well as discrete pigmented macules of the face, forearms, and hands, may occur. The hair of certain red-haired patients may turn black. In addition—and this point has not been emphasized previously—there is a characteristic change of hue in the complexion to a dusky, bluish red, and the conjunctivas become injected so that the patients, even the nonalcoholic ones, appear bleareyed and dissipated. This feature is a gradual process, often imperceptible to the person himself or to those near him, although it might be attributed to the effects of weathering.

The skin of the eyelids, the smooth periorbital zones, and various depigmented areas about the face and neck is tinted pink. Elsewhere on the exposed skin, with the pigmentation sometimes extending over the shoulders and upper part of the chest as well, the tissues are a suffused violaceous hue. The hair of the scalp and the eyebrows is usually darkened; the beard is tough, and women often have hypertrichosis. The facies bears a superficial resemblançe to that in Cushing's disease; the plethora reminds one of the skin in hypertensive states, polycythemia, or dermatomyositis. Detailed physical examination and study of the blood offer no adequate explanation for the changed complexion. Occasionally hypertension may occur. There is no disturbance of hematopoiesis; the hemoglobin, hematocrit readings, and the values for oxygen saturation of the blood are normal. There is no evidence of abnormal steroid metabolism. Spot checks reveal no sulfhemoglobin or methemoglobin. In the skin itself, no appreciable change in the capillaries or the larger vessels is apparent on microscopic examination.

An occasional small blister may appear on the face, the pinna of the ear, or the neck; the surface is easily traumatized. After exposure to heat or light, pruritus may occur, and in such cases the cheeks may show excoriations, crusts, razor cuts, and small scars. In a few instances in men, the sun-beaten skin of the nose, the cheeks, and the nuchal regions may become slightly granular and of a waxy cast, suggesting colloid milium, and, in fact, this impression is confirmed microscopically. In fixed sections, the tinctorial reaction of the underlying collagen resembles that seen in senile elastosis more than would normally be expected. Occasionally the exposed skin is toughened as in scleroderma.

Sensitivity to Light.—Although the blistering reaction of chronic porphyria appears on the sun-exposed surfaces of the skin, the exact photodynamic relation of the porphyrins to this condition has not been established. This statement is true likewise for congenital porphyria, in which photosensitivity in childhood is the predominating symptom. Attempts to reproduce the blistering reaction in the skin of patients with porphyria by exposure to natural sun or artificial light have not been successful. Perhaps it is necessary to have repeated exposure, as seems to have occurred in cases with the blistering reaction of chronic porphyria; in this connection it may be possible that certain porphyrins resident in the skin may be changed to a form in which they become active photosensitizers. In acute porphyria, cutaneous reactions seldom occur. Further study of the porphyrins in the skin may clarify this point.

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[10] (*a*) Aldrich.[6] (*b*) Grinstein, M.; Schwartz, S., and Watson, C. J.: Studies of the Uroporphyrins: I. The Purification of Uroporphyrin I and the Nature of Waldenström's Uroporphyrin, as Isolated From Porphyria Material, J. Biol. Chem. **157**: 323-343 (Jan.) 1945. (*c*) Watson, C. J.; Schwartz, S., and Hawkinson, V.: Studies of the Uroporphyrins: II. Further Studies of the Porphyrins of the Urine, Feces, Bile, and Liver in Cases of Porphyria, with Particular Reference to a Waldenström Type Porphyrin Behaving as an Entity on the Tswett Column, ibid. **157**: 345-361 (Jan.) 1945.

[11] Footnote 10*b* and *c*. McSwiney, R. R.; Nicholas, R. E. H., and Prunty, F. T. G.: The Porphyrins of Acute Porphyria: The Detection of Hitherto Unrecognized Porphyrins, Biochem. J. **46**: 147-154 (Feb.) 1950.

[12] Watson, C. J., and Larson, E. A.: The Urinary Coproporphyrins in Health and Disease, Physiol. Rev. **27**: 478-510 (July) 1947.

HEPATOTOXINS AS PRECIPITATING FACTORS IN CHRONIC PORPHYRIA

In our 17 cases some damaging influence on the liver seemed to be the common factor in provoking the manifest phase of chronic porphyria (Table 2). Measurement of liver function was carried out, when possible, by the sulfobromophthalein, zinc sulfate, and thymol turbidity tests and by estimations of the serum bilirubin and the urobilinogen in the urine.

Among the toxic influences which can damage the liver and precipitate the obvious skin lesions of chronic porphyria, first and foremost is alcohol. The 12 patients with this syndrome discussed by Szodoray and Sümegi [1d] were alcoholic, without exception, and this relationship was confirmed by our own experience with the four patients who were the subjects of our earlier reports. The role of alcoholism is strikingly enhanced by the record of observations on the 17 patients whose cases are presented herein, of whom 12 admitted to the chronic use of alcohol in varying amounts for long periods (Table 2).

Two patients in our group had syphilis; one active, one ancient. Both used alcohol to excess. Syphilis was said to be present in six of the 12 cases of Szodoray and Sümegi.[1d]

Three patients in our series had diabetes; two of these three had neuropathy which had preceded the development of signs of porphyria by almost 10 yr. One of these was a moderate drinker. The third patient first discovered that he had diabetes two years after the onset of the blistering eruption of the hands. This patient was a teetotaler although the tests revealed a mild degree of hepatic dysfunction. An older brother, an alcoholic but not a diabetic, had had a blistering eruption of a similar nature in the summer sun for 15 yr. In one instance (Case 15), there was a diabetic glucose-tolerance curve as well as pronounced retention of sulfobromophthalein. In the absence of glycosuria and with a normal fasting level of blood sugar, the abnormal glucose tolerance was attributed to hepatic dysfunction. One parent of each of two nondiabetic patients was said to be diabetic.

Two women in this series (Cases 13 and 14) had a long irregular record of unexplained vague nervousness, seemingly on a functional basis; we could find no adequate explanation for the lighting up of the clinical signs of porphyria in middle life except incrimination of the drugs which had been used as sedatives or hypnotics.

Similarly, for the patient (Case 15) who exhibited an enlarged liver and gross impairment in tests of hepatic function and who first had classic cutaneous signs of porphyria after the age of 60 yr., the usual toxic factors were not apparent on the surface. We found that large amounts of arsenic, presumably in potassium arsenite solution, had been consumed in years past for the relief of cutaneous symptoms of another sort. However, the urine did not show the presence of arsenic at the time of our examination. The patient denied the use of alcohol.

A striking feature of the chronic form of porphyria as it affects adults is the relatively benign nature of the disease process, which is in contrast to the experience of persons with acute porphyria or children with manifestations of congenital porphyria. When it was possible, with the cooperation of the patient concerned, to eliminate the continual insult to the liver, as, for example, by the strict interdiction of alcohol and the institution of a dietary regimen directed in a general way, as is done in cases of cirrhosis of the liver, improvement resulted in health and well-being and in a lessening of the degree of photosensitivity. In the diabetics, the same favorable influence was noted when the patient was under adequate insulin therapy and dietary control. In the case of the patient with suspected but unproved arsenism (Case 15), there was a progression of the symptoms of porphyria and a relapse of a state of reactive depression which required institutional management. Data at hand are insufficient to permit valid conclusions as to whether the degree of porphyrinuria parallels the grade of clinical improvement of these patients.

TABLE 2.—*Data on Hepatic Dysfunction and Contributory Causes in Seventeen Cases of the Adult Form of Chronic Porphyria with Cutaneous Manifestations*

Case	Age	Sex	Degree of Hepatic Dysfunction *	Suspected Agents †
1	57	M	+++	AAAA
2	46	M	+	AAA
3	63	M	+++ 0	AAA
4	49	M	+	AAA
5	29	M	+ ++	AAA
6	48	M	+	AA
7	61	M	+	A-AA
8	65	M	+++ ++	AAA S J
9	33	M	+ 0	AA J; SN
10	42	M	0	A DM
11	30	M	......	DM
12	57	M	+	D
13	35	F	......	B
14	42	F	0	B
15	61	F	+++ ++	...... As
16	42	M	++ ++	A JH
17	45	F	0	AA

* Graded 1 to 4, with + meaning grade 1 and +++ meaning grade 3.

† *A* to *AAAA* indicates alcoholism; *S*, neurosyphilis, arrested; *J*, jaundice (ancient); *SN*, neurosyphilis, active, treated with inoculation malaria; *DM*, diabetes mellitus with neuropathy; *D*, diabetes mellitus; *B*, sedatives, barbiturates; *As*, arsenic, and *JH*, infectious hepatitis.

The significance of porphyrins in human physiology and their relation to hepatic dysfunction and to photosensitization are not well understood. Patients with the clinical syndrome of chronic porphyria described herein appear to offer a convenient proving ground for this complex subject.

SUMMARY

A form of chronic porphyria is discussed in which the disease becomes manifest for the first time in adult life by cutaneous signs expressed as a blistering and erosive tendency of the skin, especially of the dorsa of the hands, on exposure to sun and trauma, as well as by a change in the complexion of the face and adjacent areas to a ruddy, violaceous hue. Associated symptoms of abdominal colic or nervous disorder occasionally occur. There may be spotted or diffuse melanosis of the exposed skin and the hair, and, occasionally, hypertrichosis. Milia are seen in the healed scars of the denuded and infected lesions of the hands.

Survey of the records of the 17 patients reported herein, including 13 men and four women, indicates that some damaging influence on the liver was chiefly responsible for the development of clinical symptoms. Alcoholism, the main offender, was present in 12 instances. Active diabetes mellitus occurred in three cases and syphilis in two; in one case there was a history of arsenism, and in two cases, of the use of barbiturates. In several cases more than one etiologic factor was suspected.

Under appropriate management the course was relatively benign.

Results of quantitative analysis of urinary prophyrins in the 17 cases are presented. The urine may be dark amber, sometimes pink and rarely red. In certain stages of the disease the urine may contain few or no abnormal porphyrins. Sometimes porphobilinogen is present.

Our experience indicates that the disease is commoner than is generally supposed.

In the light of our present knowledge, the exact classification of this type of porphyria is unsettled.

Mayo Clinic.

ABSTRACT OF DISCUSSION

Dr. Donald M. Pillsbury, Philadelphia: If I may digress for a minute, I think medical papers may be classified into the following groups: provocative papers—that is, those with which one may disagree; the type in which some fundamental new fact is elaborated, which sort occurs about once every five years, and then the kind in which there is an authoritative correlation of established basic facts and a discussion of their application to man. I think this paper is a beautiful example of the last-mentioned type. It is apparent in the literature that there is much interest in the problem of sensitivity to light. We are realizing that photosensitivity is a rather common state. Shelmire and Lamb showed clearly the varying objective changes in the skin which may be associated with sensitivity to light. Photosensitivity is commonly confused with other things, particularly contact dermatitis, and many times cases have been wrongly diagnosed as lupus erythematosus. Certainly the fixed erythema group of conditions may largely be due to photosensitivity. A point which Dr. Brunsting clearly makes is that persons with photosensitivity are by no means always subject to disturbances of porphyrin metabolism and, conversely, persons with such disturbances may not be photosensitive. This is a very curious fact which I hope some day we shall understand better. Another feature of the paper is the assertion that in persons with the syndrome he described there may be factors other than light which produce the eruption—heat, and particularly trauma. Dr. Brunsting is entirely correct that these persons are very sensitive; they have pronounced reactions to very mild trauma. The clinical recognition of these cases is generally fairly easy, although sometimes there are difficulties. The chemical methods involved are very difficult, and it is only in centers such as the Mayo Clinic that these complex chemical studies can be done completely. A very practical point which Dr. Brunsting brought out is that in the cases he discusses the clinical management has been reasonably satisfactory. With attention to the excessive intake of alcohol and an attempt to do something about associated hepatic disease, the clinical course is reasonably satisfactory.

Dr. Louis A. Brunsting, Rochester, Minn.: So far there has been no satisfactory explanation for the changes in color in the skin, particularly the violaceous suffusion of the exposed surfaces. There was no evidence of pellagra in any of the patients.

ENDOCRINE PATTERNS IN TERM PREGNANCIES FOLLOWING ABORTION

G. E. S. Jones, M.D.

and

Eleanor Delfs, M.D., Baltimore

The present study was undertaken to clarify, if possible, the underlying pathological factors occurring in abortion, with the hope of improving the rationale for therapy. The multiplicity of mechanical and physiological factors involved in the accomplishment of a normal term pregnancy suggests that the etiology of abortion must be manifold.

Reducing the problem to its simplest terms, there are two chief factors to be considered: the germ cells and the environment. To obtain a normal conception, both the sperm and the ovum must be normal, and fertilization must occur when both are recently shed; in short, not only must the gametes be inherently normal, but also the timing of fertilization must be optimal. Next, the environmental factors must be normal for proper growth and development of the normal trophoblast. If the environment is adequate, optimal trophoblastic growth should occur. Any degree of environmental inadequacy might presumably be reflected in the degree of defectiveness of the product of conception.

With the above concept in mind, the methods detailed below have been used to study a group of women with reproductive disorders.

The results of the studies on pregnancy of normal women [1] (Figs. 1 and 2), as well as of those on pregnancy terminating in abortion,[2] have been previously reported.[1]

From the Departments of Gynecology and Obstetrics, Johns Hopkins University and Johns Hopkins Hospital.

This study was made under a grant from The National Research Council, Committee on Human Reproduction.

This article has been shortened for publication in The Journal by the omission of Figures 5 to 10 and 13 to 16. These will appear in the author's reprints.

Read before the Section on Obstetrics and Gynecology at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 29, 1950.

[1] Jones, G. E. S.; Delfs, E., and Stran, H. M.: Chorionic Gonadotropin and Pregnanediol Values in Normal Pregnancy, Bull. Johns Hopkins Hosp. 75:359, 1944.

METHODS

Quantitative serum chorionic-gonadotropin assays have been used as a measure of trophoblastic growth and development. As this hormone is produced directly by the trophoblastic cells,[3] it is believed that the levels of this hormone reflect the normality of the growing conceptus. The known function of this hormone is to prolong the secretory capacity of the corpus luteum. The assay method employed is that developed by Delfs.[4] The normal levels were established by a consecutive study of 24 normal women throughout term pregnancies.[1]

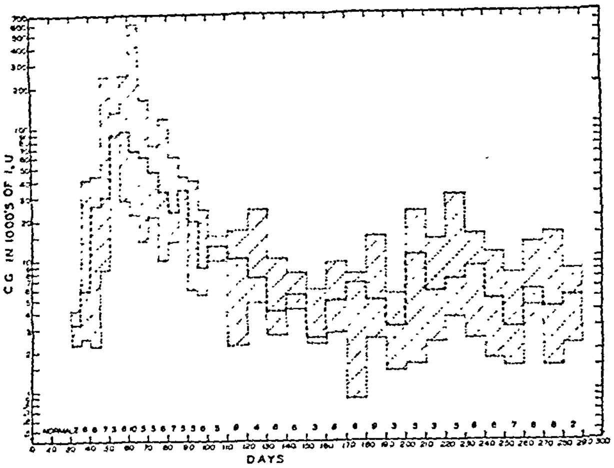

Fig. 1.—Serum chorionic-gonadotropin values throughout 24 pregnancies of normal women. The chorionic-gonadotropin values are recorded in international units per liter of serum on a semilogarithmic scale. The days of pregnancy are recorded from the first day of the last menstrual period. In this and the following figures, the extreme range of values is designated by the interrupted cross-hatched area, and the median value for each block is marked by the heavy interrupted line. The number of pregnancies studied, not individual assays, during every five-day period to day 100 and every 10-day period thereafter is recorded below the corresponding block.

Semen examinations have been done to check the male germ plasm.

Urinary pregnanediol determinations have been used as a measure of an important environmental factor. Pregnanediol is a metabolite of progesterone, the excretion of which is, in general, a mirror of progesterone production. Adequate amounts of pregnanediol can be interpreted as indicative of adequate progesterone production and indirectly as showing endometrial preparation for the nourishment of the growing trophoblast. Pregnanediol has been assayed by the Astwood-Jones[5] method for free pregnanediol. The criterion of normal has been the values found in the consecutive study throughout 24 normal pregnancies.[1] In the interpretation of the pregnanediol data it should be remembered that the major site of progesterone production during the first 100 or so days of pregnancy is probably the corpus luteum. After this time, the function is apparently taken over by the placenta. This is reflected in the relatively steady pregnanediol output during the first three months of pregnancy, followed by a gradual steady rise. These two phases of progesterone production will be referred to as the luteal phase and the placental phase.

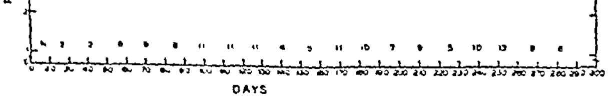

Fig. 2.—Urinary pregnanediol excretion throughout 24 pregnancies of normal women. The pregnanediol values are recorded in milligrams per 24 hr. on a semilogarithmic scale. The days of pregnancy are counted from the first day of the last menstrual period, and the extreme range of values is designated by the interrupted cross-hatched area. The median value for each block is marked by the heavy interrupted line. The number of pregnancies studied, not individual assays, during two-week intervals is recorded below the corresponding block.

Anatomical, nutritional, and metabolic functions were investigated as possible factors that might influence the development of the germ plasm directly or indirectly through the environment.

Curettages and hysterograms were done to evaluate the anatomical uterine environment. Determinations of serum vitamin E,[6] basal metabolic rate, blood cholesterol, and blood sugar, and when possible dextrose-tolerance tests, were carried out. Brucella agglutinations were done in many instances but did not prove helpful. Rh-typing was done but appears not to be significant. Basal temperature charts were kept when possible for evaluation of luteal phase and as a check on intercourse habits; these also helped in the early detection of pregnancy but have not been used for timing intercourse. Whenever possible, all studies were done when the patients were not pregnant. Cases associated with positive Wassermann reactions and untreated syphilis were excluded.

All defects found were treated when possible; if no defects were found, no therapy was given. When abortions occurred, the abortus were examined pathologically and grouped according to the Carnegie classification.[7] Abnormal trophoblastic development is designated by Carnegie Abortion Types I to V, Type I being the most abnormal and Type V the least abnormal. Type VI is a normally formed fetus that is not sufficiently developed for the duration of the pregnancy, and Type VII is a normal fetus of the proper developmental age.

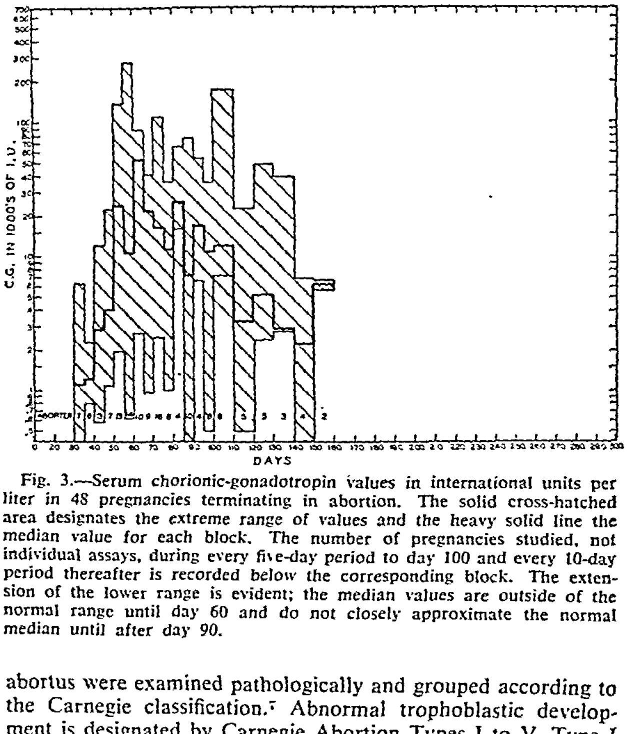

Fig. 3.—Serum chorionic-gonadotropin values in international units per liter in 48 pregnancies terminating in abortion. The solid cross-hatched area designates the extreme range of values and the heavy solid line the median value for each block. The number of pregnancies studied, not individual assays, during every five-day period to day 100 and every 10-day period thereafter is recorded below the corresponding block. The extension of the lower range is evident; the median values are outside of the normal range until day 60 and do not closely approximate the normal median until after day 90.

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2. Delfs, E., and Jones, G. E. S.: Endocrine Patterns in Abortion, Obst. & Gynec. Surv. 3:680, 1948.
3. Jones, G. E. S.; Gey, G. O., and Gey, M. K.: Hormone Production by Placental Cells Maintained in Continuous Culture, Bull. Johns Hopkins Hosp. 72:26, 1943.
4. Delfs, E.: An Assay Method for Human Chorionic Gonadotropin, Endocrinology 28:196, 1941.
5. Astwood, E. B., and Jones, G. E. S.: A Simple Method for the Quantitative Determination of Pregnanediol in Human Urine, J. Biol. Chem. 137:397, 1941.
6. Eastman, M. J., and Stran, H. M.: Vitamin E Serum Determination, unpublished data.
7. Mall, F. P., and Meyer, A.: Studies on Abortuses: A Survey of Pathological Ova in the Carnegie Embryological Collection, in Contributions to Embryology, Carnegie Institution of Washington, vol. 12, p. 41, 1921.

MATERIAL

One hundred seven women have been studied as described throughout 120 pregnancies. The actual reproductive histories are shown in Table 1, according to the outcome of the pregnancy studied, previous number of consecutive abortions, and previous term pregnancies. Forty-eight of the entire series of pregnancies studied terminated in abortion, and 72 ended successfully at term. Seventy-four of the pregnancies studied occurred in women who had had three or more consecutive abortions. This group of patients has been analyzed separately in a brief section on therapy.

CHORIONIC-GONADOTROPIN AND PREGNANEDIOL STUDIES

Abortion.—The median values of serum chorionic gonadotropin during the 46 pregnancies terminating in abortion were considerably lower than normal (Fig. 3). The most pronounced difference was observed before the 60th day of pregnancy. Day 1 is counted as the first day of the last menstrual period. The general shape of the curve is the same, but the rise is slow, the peak is less pronounced, and the fall is more precipitate and earlier. The fact that 19 of the abortions were associated with normal chorionic gonadotropin is reflected by the fact that the upper limits of the range fall within the range of normal. The pregnanediol levels are also lower than normal (Fig. 4). The median values are outside the normal or at the extreme lower limits, and the lowest value in the range is 0 until the 108th day. With the exception of one two-week interval, during which only two pregnancies were studied, there is no evidence of a placental phase.

TABLE 1.—*Number of Pregnancies Studied in Relation to Number of Previous Consecutive Abortions in 107 Patients (120 Pregnancies)*

Outcome of Pregnancy Studied	Previous Consecutive Abortions 0	1	2	3	4	5	Total Series	Total Patients with 3 or More
Abortion	3 (2)*	3 (1)	13 (7)	12 (1)	8 (0)	9 (1)	48 (12)	29 (2)
Term delivery	0 (0)	8 (2)	19 (2)	29 (12)	10 (2)	6 (0)	72 (18)	45 (14)
Totals	3 (2)	11 (3)	32 (9)	41 (13)	18 (2)	15 (1)	120 (30)	74 (16)

* Numbers in parentheses indicate patients in each group with previous term pregnancies.

The median curves are of statistical interest, as they demonstrate graphically the possibilities and limitations in utilizing the assays for prognostic purposes. Each patient's prognosis can be made accurately only on the basis of her individual values. The curves of individual patients lend themselves far better to interpretation and evaluation. The evidence has been previously presented in detail,[2] and the individual curves have been divided into four general groups: (1) those showing primary defects in chorionic gonadotropin, with normal or progressively falling pregnanediol values; (2) those showing defects in both chorionic-gonadotropin and pregnanediol levels; (3) those showing initially normal chorionic-gonadotropin values and primary defects in pregnanediol excretion, and (4) those with no defects.

There were eight pregnancies in group 1, i. e., cases showing chorionic-gonadotropin defects and only terminal pregnanediol defects. These might be interpreted as indicative of a primarily defective trophoblast (Fig. 5).

There were 17 patients in group 2, i. e., those with both abnormal chorionic gonadotropin and pregnanediol. In this group it is often impossible to be sure which defect played the major role in the abortion. Both could be primary defects and not interdependent. Occasionally, however, clues are obtained by evaluation of factors, such as known sperm defects, pathological type of previous abortions, or disturbed metabolic status. Figure 6 shows levels in a case of abortion due to possibly defective germ plasm with inadequate chorionic gonadotropin, resulting in inadequate luteal function. The semen specimen of the husband of this patient was defective on analysis. Figure 7 demonstrates the levels in a case that was of probably environmental origin, as the abortus was normal but smaller than expected for the duration of pregnancy. This was known to be correct as checked by the basal temperature chart and the initial appearance of chorionic gonadotropin in the serum. The last chorionic-gonadotropin value was in the normal range.

There were 10 pregnancies in group 3, i. e., cases associated with normal chorionic-gonadotropin levels and lowered pregnanediol levels. Three were due to early corpus-luteum failures; seven were caused by late placental-type failures. Figure 8 shows the values for a patient with corpus luteum-pregnanediol failure, and Figure 9, those for a patient with late placental-pregnanediol failure.

Group 4 consisted of nine pregnancies. This group showed no appreciable deviation from the normal in either the pregnanediol or the chorionic-gonadotropin curves (Fig. 10). Two patients showed terminally low values only after it had been estimated clinically that death in utero had occurred; both passed grossly normal fetuses.

Term Pregnancy.—The median values for serum chorionic gonadotropin and urinary pregnanediol obtained during 73 term pregnancies of women with previous reproductive difficulties have been compared with the normal ranges (Fig. 11). The curve nearly approximates the normal, and the median values are within normal limits after day 35. The early median values, however, still lag behind the normal median values, and it is not until about the 68th day that the chorionic-gonadotropin values finally approximate the normal. The median pregnanediol values approximate the normal very closely, but the extreme spread is greater, owing entirely to an extension of the lower values. It is noteworthy that, although in three two-week intervals values below 2 mg. were obtained, there were no values of 0 during the pregnancies that went to term. After 150 days values below 10 mg. occurred in only one interval. All these patients showed a consistent pregnanediol output, and, although values were distinctly below normal in some patients, an absolute deficiency did not occur (Fig. 12). There is a suggestion that the chorionic-gonadotropin level tends to drop more precipitously and sooner and that the pregnanediol rise occurs slightly later than among the normal women.

Thus, the placental take-over period in the group of women with poor reproductive histories may be more critical than in the normal women. A study of individual patient's values indicates this point more clearly than do median statistical values.

When individual cases are considered instead of median values, interesting observations may be made.

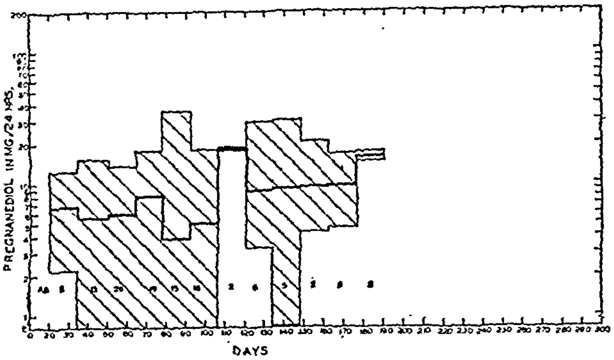

Fig. 4.—Urinary pregnanediol excretion in milligrams per 24 hr. in 48 pregnancies terminating in abortion. The solid cross-hatched area designates the extreme range of values and the heavy solid line is the median value for each block. The number of pregnancies studied, not individual assays, during two-week intervals is recorded below the corresponding block. The number of intervals during which a value of less than 1 mg. was obtained is notable. The median values are most abnormal during the placental phase.

The two patients in the group who showed distinctly abnormal chorionic-gonadotropin curves (Fig. 13) delivered very small babies (weighing 1,865 gm. and 2,580 gm.) at term; both were otherwise normal and have since done well. Four patients showed late chorionic-gonadotropin peaks. Another patient showed an unusually rapid chorionic-gonadotropin fall to an extremely low level, and this patient delivered on day 235 a 1,740-gm. baby that survived (Fig. 14).

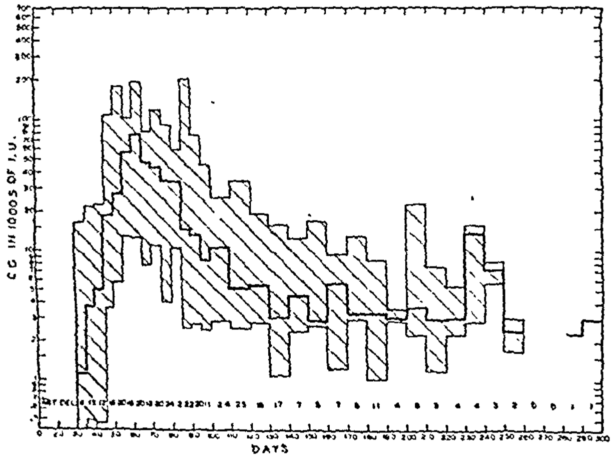

Fig. 11.—Serum chorionic-gonadotropin range and median values throughout 72 pregnancies in women with previous abortions. The general shapes of the median curve and range are similar to the normal. However, the median level is below normal until day 60, and the range throughout is broader.

Three patients showed consistently low pregnanediol values of both the luteal and the placental phase (Fig. 15). Six had luteal-phase pregnanediol deficiencies, two of which were associated with slow placental take-over periods (Fig. 16). An additional seven patients showed slow placental take-over periods, and three never established a normal placental pregnanediol level. One of these patients delivered prematurely, and the baby died at home of unknown cause after one month. Twelve had low placental-pregnanediol values.

THYROID STUDIES

The diagnosis of lowered thyroid function among the 107 women was on the basis of a basal metabolic rate of — 5% or less and/or a blood-cholesterol value of 250 mg. per hundred cubic centimeters or above in the nonpregnant state. Sixty-seven of the 120 pregnancies studied, or 55.8%, were associated with a lowered thyroid function. If only the series with true habitual abortion is considered, the percentage rises to 63.5%.

Twenty-six of the 67 pregnancies during which thyroid dysfunction occurred were associated with no other abnormality; four showed, in addition, low chorionic-gonadotropin levels; 21 were associated with pregnanediol deficiencies, and 16 had concurrent low vitamin E serum levels. Four women in the group had anatomical abnormalities; semen analysis for one woman's husband revealed abnormalities. These groups are not mutually exclusive.

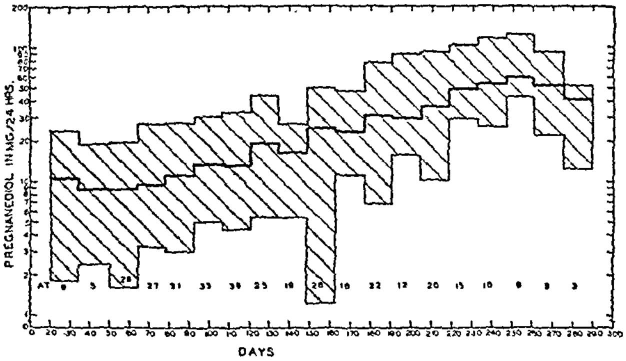

Fig. 12.—Urinary pregnanediol range and median values throughout 72 pregnancies in women with previous abortions. The lower range is much broader than the normal. Extremely low values are encountered occasionally as late as day 162. Median values are slightly lower than normal.

VITAMIN E

Seventy-eight women in the entire series were studied by means of serum-tocopherol levels. Twenty, or 25%, showed values below 0.9 mg. per hundred cubic centimeters, which has been judged as the lower limit of normal. Low vitamin-E levels occurred as a sole deficiency only twice. As a lowered serum tocopherol level was found oftener among the Negro patients and women with apparent nutritional disturbances, it is possible that this deficiency mirrors the general nutritional status of the patient.

SEMEN ANALYSIS

Semen specimens of 48 husbands were appraised, and seven were judged to be abnormal on the basis of the count, motility, and morphology. Six of the seven pregnancies associated with an abnormal semen analysis terminated in abortion. The woman who had a successful pregnancy was studied for the first time when she was eight weeks' pregnant. There had been abstinence from intercourse for one month before the specimen was obtained, and although the count was reduced the differential was normal. Such a finding may represent a technical error due to loss of the first portion in the collection.

Abnormal semen on analysis occurred as a sole deficiency only once in the total series. Although it would appear to be a defect with grave prognostic significance, it must be remembered that such defects can be corrected to some extent by urological care and improved general hygiene. Two of the women in the present series aborted at a time that the husband was found to have defective semen analysis. One of the women had lowered thyroid function and the other vitamin-E deficiency. Both women returned for study several years later, at which time normal semen specimens were obtained for analysis. Both delivered normal babies at term, the former with thyroid therapy and the latter without therapy, as during her second period of study the serum-tocopherol level was normal.

ANATOMICAL ABNORMALITIES

Anatomical abnormalities were encountered seven times in the entire series, but only once as a sole factor. Five of the seven pregnancies terminated in abortion. Three women who had bicornate uteri aborted. This condition occurred as a sole defect twice; once associated with a lowered thyroid function, and once with an abnormal semen analysis. Three women had myomas of the uterus; all were associated with lowered thyroid function, and two had had myomectomies. Two of these women aborted while receiving apparently adequate therapy; the third delivered at term. This woman had had the last of her three consecutive abortions after a myomectomy and prior to thyroid therapy. The seventh patient in the group had a malformation of the urogenital sinus with a rectovaginal cloaca; she also had abnormal thyroid function and carried to term successfully while receiving therapy.

TABLE 2.—*Correlation of Pathological and Endocrine Patterns in 41 Cases of Abortions*

	No. of Cases	Pathological Type of Abortus		Thyroid Status		Time of Abortion, Days			
		I-V	VI-VII	Low	Normal	0-90	91-120	121-220	221+
Group 1........	8	7	1	6	2	6	2	0	..
Group 2........	15	10	5	10	5	11	3	1	..
Group 3........	10	..	10	3	7	..	2	5	3
Group 4........	8	1	7	2	6	3	2	3	..
Totals........	41	18	23	21	20	19	9	9	3

DIABETES

There was only one woman in the series known to have had diabetes. The patient was a 34-yr.-old multigravida who had had two normal term pregnancies, followed by two abortions. In a second marriage she had a third abortion. During three subsequent pregnancies she was studied, and no abnormalities were found. No specific therapy was given in any of these pregnancies. The first went to term; the second resulted in abortion, and the third again went to term. The year after the last delivery, she displayed a diabetic-type dextrose tolerance curve. The relationship between the diabetes and the previous reproductive difficulties is problematical. Perhaps, however, women with late miscarriages and no abnormal findings deserve careful follow-up studies throughout the years.

PATHOLOGICAL CLASSIFICATION OF ABORTIONS

A correlation of the types of endocrine patterns with the pathological type of the abortus is show in Table 2. The more abnormal abortus are closely correlated with abnormal chorionic-gonadotropin values.

Among the eight cases in group 1, i. e., those showing defective chorionic-gonadotropin, only one abortus was normally developed; the other six were of a low Carnegie type.

There were 15 patients in group 2, i. e., those showing both defective serum chorionic-gonadotropin and pregnanediol excretion. Ten abortuses were defective, being Carnegie Types I to V; three were Carnegie Type VI abortus; two were Type VII.

Of 10 patients in group 3, i. e., those with normal chorionic-gonadotropin values and abnormal pregnanediol, eight delivered normally formed fetuses; one delivered an abortus that showed extrophy of the bladder and abdominal eventration, and one delivered a Carnegie Type VI, i. e., a normally formed, fetus but not of the proper developmental age. The latter two patients had early luteal failures.

Of the eight patients in group 4, i. e., those showing no hormonal pattern abnormalities, seven aborted normally formed fetuses and one had a defective abortus. It is of interest that the sperm of this patient's husband was defective on analysis.

When the thyroid status of these women was analyzed, a greater incidence of low thyroid function was correlated with defective chorionic-gonadotropin and low Carnegie types of abortus; the majority of abortions also occurred at an early stage of pregnancy. As might be expected, the women in group 3, i. e., those who had normal chorionic-gonadotropin values and low placental pregnanediol values, tended to abort late; three of these women carried to 220 days or more, two giving birth to living infants that survived several hours.

THERAPY

The aim of therapy has been to restore all demonstrable abnormalities to normal. Therefore, all defects found have been treated when feasible. An attempt has been made to study patients before they become pregnant, as it is our impression that the most effective treatment is usually given before or in the cycle during which pregnancy occurs. If no defect was found, no specific therapy was given.

Thirty-two to 96 mg. a day of desiccated thyroid has been the range of dosage, although an occasional patient has received 128 mg. a day. Experience with hyperthyroid states in women and excessive thyroxin administration in experimental animals [8] has amply demonstrated that overdosage with thyroid may be disastrous. Therapy is started three months before a pregnancy is advised.

Sixty milligrams of pregneninolone (progestoral®) [9] a day given orally, or 12.5 mg. of progesterone daily given intramuscularly, has been used for luteal-pregnanediol deficiencies. The most effective therapy is given in the cycle during which pregnancy occurs. With the use of basal temperature curves, it can be prescribed on the fifth postovulatory day and continued as long as indicated by urinary pregnanediol determinations.

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[8] Gudernatsch, J. F.: Feeding Experiments on Rats: III. A Further Contribution to the Knowledge of Organ with an Internal Secretion, Am. J. Physiol. **36**: 370, 1915.

[9] The dose was determined by endometrial biopsy studies (Seegar, G. E.: Am. J. Obst. & Gynec. **39**: 469, 1940). Linguet® administration of pregneninolone does not enable one to reduce the dose, as it has been determined also by biopsy studies that 60 mg. of pregneninolone given sublingually produces minimal progestational changes in the properly prepared endometrium. There is no progestational change demonstrable in the majority of cases at a lower dose level.

The amount of progestogen necessary as supplementary therapy in the late placental-pregnanediol deficiencies is not well established. In the present series oral doses of 150 mg. a day of pregneninolone or intramuscular administration of 25 mg. of progesterone, has been generally employed. The pregneninolone has been preferred, as it is not recoverable in the urine as pregnanediol and, therefore, does not interfere with the interpretation of the pregnanediol data.

The dose of vitamin E as alpha-tocopherol (ephynal®) acetate has been 25 mg. a day for two or three months, or until the serum-tocopherol level is within normal limits.

Women with chorionic-gonadotropin deficiencies have not been treated, as these deficiencies have been interpreted as reflecting the poor developmental state of the conceptus. If this assumption is correct, the use of chorionic-gonadotropin as replacement therapy is untenable.

Dietary deficiencies have been corrected when indicated. Careful attention is also given to the general hygiene and habits of the patient.

It should not be necessary to say that good prepartum obstetrical care is the fundamental basis for all therapy. Without it, every specific therapy may prove futile.

EVALUATION OF THERAPY

The evaluation of therapy must be made on the basis of data from patients having three or more previous consecutive abortions. There were 74 pregnancies studied among patients in this classification. Sixteen of these women had had previous term pregnancies. Forty-five pregnancies carried to term, and 29 aborted.

In Table 3 the 74 pregnancies have been divided into three groups, according to the indications for therapy and therapy given. Group A represents those pregnancies during which indications for therapy were found, and adequate therapy was given. Group B represents those pregnancies during which therapeutic indications were found, but no therapy was given—usually because the patient presented herself for study when already pregnant or because the indications for therapy were not recognized in time. Group C represents those pregnancies in which no basis for therapy was discovered, and, therefore, no therapy was given; this group includes those women in whom an anatomical abnormality and the husband's defective semen on analysis were the sole defects.

When the pregnancies are thus classified according to abortions and term deliveries, it is apparent that there is an 85% therapeutic success in group A, or the treatment series. In group B, in which therapy was indicated but not given, the term delivery rate is only 21%. It is of interest that the five successful pregnancies in this group all showed placental types of pregnanediol deficiencies, and two terminated in premature deliveries with live babies that survived. As can be seen from a careful study of the pregnanediol range found among this group of patients (Fig. 12), the pregnanediol deficiencies were relative to those in pregnancies of normal women, not absolute. It is possible that women with such deficiencies are maintained in a relatively delicate state of balance and may carry at least to viability if nothing untoward occurs to disturb this balance. In Group C, in which no therapeutic indications were discovered, and, therefore, no specific therapy was given, 50% of the pregnancies ended in term deliveries. By adding groups A and C together, the total number of patients managed according to indications is obtained. Forty of 51 pregnancies, or 78%, carried to term. This figure probably best represents the expected therapeutic success for women with habitual abortion, using the method of case management described, with present methods of investigation and adequate therapy.

All the infants delivered in the present series were physically normal. There is no reason to believe, from the material at hand, that therapy in women with repeated abortion enhances the probability of a malformed child.

TABLE 3.—*Summary of Therapy and Therapeutic Indications Among 74 Pregnancies Studied in Women with Three or More Consecutive Abortions*

	Aborted	Term	Total	% Success
Group A				
Therapeutic indications:				
Therapy given	6	35	41	85
Group B				
Therapeutic indications:				
No therapy given	18	5*	23	22
Group C				
No therapeutic indications:				
No therapy	5†	5	10	50

* In all five cases patients had pregnanediol deficiencies (2 premature babies).

† In one case the husband's sperm was defective. In a second case there was defective sperm and bicornate uterus. A third patient had a bicornate uterus.

SUMMARY AND CONCLUSIONS

A method for the study of women with reproductive problems is presented in an effort to clarify some of the etiological factors involved in such disorders. With the diagnostic methods used, certain divergent groupings have emerged. It is to be hoped that, with the acquisition of further knowledge in the field of reproductive physiology, additional diagnostic aids will become available for the extension of this method of approach.

One hundred and twenty pregnancies have been studied in women with abnormal reproductive histories. Repeated serum chorionic-gonadotropin assays, determinations of urinary pregnanediol, basal metabolic rate, blood cholesterol, blood sugar, dextrose-tolerance curves, and serum tocopherol, and analysis of husband's semen, in addition to the routine gynecologic type of investigation, have been made. Forty-eight of 120 pregnancies resulted in abortion and 72 in delivery at or near term.

A comparison of certain endocrine patterns during term pregnancies in women having poor reproductive histories with those in normal women shows that both the median chorionic-gonadotropin and the pregnanediol levels are somewhat lower than normal. The median values during pregnancies terminating in abortion are still lower than those proceeding to term and markedly lower than those noted during pregnancies of normal women.

Four types of endocrine patterns are recognized among the pregnancies terminating in abortion, and it is apparent that such patterns may be useful in clarifying the etiology of abortion. The same patterns are discernible in a less exaggerated form among term pregnancies of women with poor reproductive histories.

The pathological types of abortus are closely correlated with the hormonal patterns.

In the majority of instances multiple deficiencies were found. Lowered thyroid function occurred 67 times, pregnanediol deficiencies 39 times, chorionic-gonadotropin deficiencies 27 times, vitamin-E deficiencies 20 times, and semen abnormalities and anatomical pelvic defects each seven times.

The aim of therapy has been to correct all demonstrable deficiencies. When this was accomplished, the therapeutic success was 78% in patients with three or more previous consecutive abortions. If those pregnancies in which no therapeutic indications were found are excluded, the therapeutic success rises to 85%.

715 N. Charles St. 1 (Dr. Jones).

ABSTRACT OF DISCUSSION

Dr. J. P. Pratt, Detroit: One of the fallacies regarding the importance of the corpus luteum in the maintenance of pregnancy and abortion began nearly half a century ago with the experimental work of Fraenkel on rabbits. When he removed or destroyed the corpus luteum during pregnancy in those animals, abortion always resulted. It was assumed that the cause of abortion in women had been found, and numerous preparations of corpus luteum, now known to lack potency, were employed. Excellent results were acclaimed. Gradually, it was learned that species differed a great deal in their needs for the corpus luteum to maintain pregnancy. It would be possible to classify different species according to this relationship, with rabbits at one extreme needing the corpus luteum throughout pregnancy and guinea pigs at the other extreme. Just where the human being belongs in this series is still debatable, but there is good evidence that, in general, the importance of the corpus luteum has been overrated. Numerous instances are on record showing that pregnancy has proceeded normally even though the corpus luteum had been removed as early as the 21st day of the cycle. It was stated that the known function of chorionic gonadotropin is to prolong the secretory capacity of the corpus luteum. May I ask Dr. Jones whether she refers to the human being or some other species. If the reference is to human beings, how can one explain the finding of a normal level of chorionic gonadotropin in 18 of 41 women who aborted? It would be still more enlightening if we knew how many women with a low level of chorionic gonadotropin carried their pregnancy normally to term. It is accepted that the trophoblast secretes chorionic gonadotropin. What explanation is there for such a rapid rise to a peak about the fiftieth day? If it is to be assumed that the level of chorionic gonadotropin reflects normality of growth of the conceptus, why does the level of secretion fall so early in normal pregnancy while the conceptus is still growing? Is it fair to assume that chorionic gonadotropin is a quantitative indicator of normalcy of the trophoblast? Pregnanediol determinations were offered as evidence of normalcy of pregnancy. It was assumed that the placenta secretes progesterone and that the placenta takes over the process of supplying progesterone after about the 100th day of pregnancy. It is established that progesterone is found in the placenta, but is there any satisfactory evidence that it is secreted by the placenta? Of the 41 women who aborted, 16 had normal pregnanediol levels. This corresponds with other reports that women with normal or even high levels have aborted and women with persistently low levels of pregnanediol have delivered normally at term. It is interesting to note that many variations from normal were found; sometimes several in the same patient. The report of the assays of chorionic gonadotropin and pregnanediol in this group of patients is a distinct contribution.

Dr. Pendleton Tompkins, San Francisco: Arthur Hertig and others found that more than 50% of aborted embryos were anatomically abnormal. If more than half of all abortions are due to fetal maldevelopment, it would seem to be impossible—or unwise—to salvage more than 50% of the jeopardized pregnancies. So strong has been the impression made by Hertig's figures that a question has arisen with regard to reports of 70 and 80% success in the treatment of repeated abortion. The issue is whether the successes may be attributed to the therapy administered, or whether the successes are due to the happy chance that a "better" ovum has been fertilized by a "better" sperm. Dr. Jones implies that a husband with a "deficient sperm count" may be responsible for fetal malformation. I have not seen any data on the human being that proves that sperm of poor quality produces embryos of poor quality. Some anomalies are due to malnutrition of the mother, some to viruses, and some to genetic factors. After adding all these known influences we are left with no explanation for the majority of abnormalities. That the conceptus might be influenced by its environment is a foregone conclusion; nevertheless, it is a conclusion not easily proved. The work by Dr. Jones is important because it demonstrates by objective measurements (hormone assays) a correlation between a faulty endocrine environment and a defective embryo. She concludes that the environment influences the development of the embryo. The reverse position, namely, that a faulty embryo usually produces an abnormal endocrine balance, is scarcely tenable for, if this were true, administration of hormones to the mother should not be effective in preventing abortion. We ask at what stage in gestation this environment is requisite. The author secured the best results when corrective therapy was first administered in the cycle of conception or in the previous cycle. Her results re-enforce the suggestion by Rutherford and others that in cases of habitual abortion progesterone should be administered immediately after ovulation when it seems likely that fertilization has occurred. The basal temperature chart is useful when such a plan is undertaken.

Dr. G. E. S. Jones, Baltimore: Dr. Pratt asks if we mean chorionic gonadotropin prolongs the life span of the corpus luteum in the human being. We did mean that. Experiments using chorionic preparations in normal, nonpregnant women substantiate this fact. Dr. Pratt asked: If this is true, how do we account for the findings of normal chorionic gonadotropin in 18 of 41 women who aborted? I think chorionic-gonadotropin failure, or trophoblastic abnormalities, are only one cause of abortion. Abortion in women with normal chorionic-gonadotropin values must have some other cause, such as anatomical or nutritional faults. How do we account for the fact that the trophoblastic secretion of chorionic gonadotropin rises to its peak at the 50th day and then declines? The histological evidence indicates that the trophoblastic cellular activity is also at a peak about that time. Perhaps the corpus-luteum cells are increasingly difficult to stimulate, and, therefore, more and more hormone may be necessary. After the 50th day it is possible to remove the corpus luteum in the human being and still maintain the pregnancy. This is another indication that the placenta takes over the progesterone function. In animals, of course, even animals as high in the scale as the ape, the chorionic gonadotropin is not produced after the first trimester of pregnancy. This may indicate that chorionic gonadotropin has no function after the first trimester of pregnancy and is simply an additional protective mechanism in the human woman. Why are there women with normal pregnanediol levels who aborted and ones with low levels who did not abort? A normal pregnanediol level is no more proof against an abortion than a normal chorionic-gonadotropin value. Mechanical and anatomical factors may play a part in such case, as well as other unknown factors. Most of the patients who showed low pregnanediol levels early in pregnancy and did not abort were being treated with pregneninolone, which, although a progestogen, is not excreted as pregnanediol. We believe this may have helped such women to continue to term. Some of the women with low levels later in pregnancy apparently could carry to term without treatment. This is another indication that the deficiency is a relative rather than an absolute one.

SKIN GRAFTING FOR THE GENERAL PRACTITIONER

Donald E. Barker, M.D., Los Angeles

Since the last war, there has been a marked shift of skin grafting from the specialist to the general practitioner and general surgeon. The practitioner in the small town is unable to send his smaller burn cases to the city and therefore has to treat them himself. Those who have had little experience in this field are confused by the vast array of literature and unexplained terms of grafting. An attempt is made here to provide a simple means of grafting for physicians practicing in small communities. As many articles have been written on the care of wounds and burns, repetition here would be of little value. To the general practitioner, much of the material written about grafting is either not on hand or unobtainable at the time. For this reason, only the simple dressings are described here.

Any wound can be grafted. However, one is more successful if the wound is clean. The term "clean" is confusing, but it means that the area to be grafted should be free of necrotic tissue and gross pus. If there is a pronounced purulent discharge from the wound, a simple dressing saturated with a 2% boric acid solution every three hours for two to three days will remove the gross contamination. No open wound is ever entirely free of some discharge. One may also take a knife and scrape off the old granulations several days before grafting and put on a dressing to which has been applied 2% boric acid ointment. This is wrapped securely so that a firm pressure is applied.

METHODS OF SKIN GRAFTING

There are a number of means of taking skin grafts. The use of a long skin grafting knife is not advisable because of the training necessary to master its use. I do not like the pinch grafts either, because they almost double the operating time and also cause bad disfigurement of the donor and recipient site. The machine I prefer is the vacutome, which uses only suction for obtaining the grafts. It is inexpensive and simple to operate; anyone can cut a graft with it. There are no special glues or tapes to buy nor does it get out of order. Figure 1 shows the machine ready for use. The thigh is the donor area used by most physicians in obtaining a graft. I usually prepare the thigh all the way around, and then place a sterile rolled-up sheet under the thigh to flatten it out so that a wide graft can be obtained. A graft taken at 0.015 of an inch thick is ideal for any situation, although some persons recommend one thickness of skin for one procedure and another for some other procedure. The depth of cut is simply adjusted by turning the thumb screw two notches to the left. A thin layer of petrolatum (vaseline) is applied to the skin where the graft is to be taken. The vacutome is attached to any standard suction found in any hospital. The machine is then pressed on the skin, and the knife is rotated into position so that it touches the skin. With easy strokes, the knife is moved back and forth while the machine is slowly pulled along the skin. Care is taken that the blade holder is held tight against the box at all times. The graft that has been cut rolls over the back of the blade holder. When the desired length of graft is obtained, one lifts the machine off and cuts the graft with a pair of scissors. Figure 2 shows a Steinmann's pin inserted under the skin for countertraction. The graft obtained is shown in figure 3. This machine has several advantages over the glue type. They are as follows: (1) Time is saved when glue is not used. (2) The glue does not have to be removed from the skin after the graft is taken. This often causes the skin to become rolled and glued together unless it is handled carefully. (3) Humidity and sterilizing solutions do not affect the area where the graft is obtained. Figure 4 shows a graft one year after operation.

Another method of obtaining grafts is the use of the dermatome or glue machine. The depth of cut can be adjusted here in a similar manner to that of the vacutome. The trick in the use of this machine is for one to cleanse the skin with tincture of benzalkonium (zephiran®) chloride or thimerosal (merthiolate®) and after it has dried, to thoroughly dry the area by wiping it repeatedly with an ether-soaked sponge. The glue is applied to both the drum of the machine and the skin and should be allowed to dry for five minutes before the machine is applied to the skin. This glue is on the order of the common tire cement and holds better after a long period of drying than when it is just applied. The drum is applied to the skin and held in place about 10 seconds to get union, and then one should very carefully bring the knife into position against the skin. If the glue does not hold, it is useless to try and press it on again, as it has pulled off from either the skin or the drum. In this case, it is necessary to take the drum off and reapply the glue. The graft is cut when the blade moves along in a manner

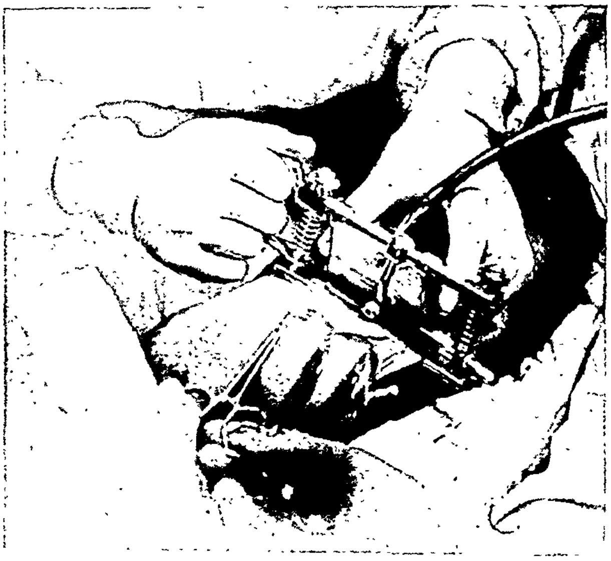

Fig. 1.—Photograph showing vacutome in position.

similar to that of the vacutome. After the graft has been cut, it is picked up on the corners with hemostats and pulled off the drum. Care should be used so that the skin surfaces do not touch, or they will stick together. To prevent sticking, the surface may be dusted with sulfathiazole powder or petrolatum may be applied.

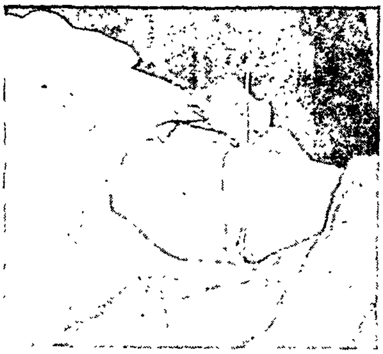

Fig. 2.—Photograph showing Steinmann's pin used for countertraction.

TREATMENT OF GRAFTS

There are many methods in treatment of the grafts. I will explain only the simple ones that can be used with the facilities at any hospital. On my grafts, I like to make drain holes with a no. 11 blade and then sew them in place. Bleeding should be controlled prior to application of the graft. I prefer to sew my grafts in place with a no. 3-0 silk; however, any kind will do. A method that forms a secure dressing is to leave the ends of some of the sutures very long so that they can be used to tie a number of fluffed-up sponges in place and give localized pressure. The simplest type of dressing to use over a graft is 4 by 4 in. gauze opened up and laid on the graft. On top of this should be placed a number of flat sponges moistened with either 2% boric acid or normal saline solutions. A few fluffed-up sponges on top of this forms an ideal dressing. I usually tie them in place with the sutures, although this is not necessary. It is bandaged with a sterile elastic bandage. Ordinary rolled bandage is poor because of its inability to give steady pressure. The dressing is moistened every three hours with either boric acid or saline solutions.

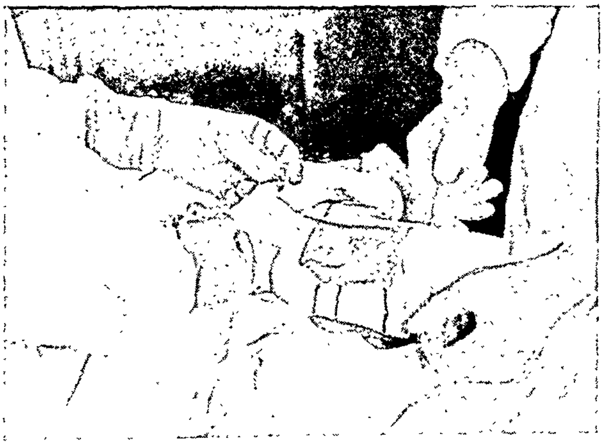

Fig. 3.—Photograph showing graft obtained over a firm base without suction.

An alternate method is for one to apply strips of petrolatum gauze over the graft and on the top of this, place the sponges and the fluffs. If petrolatum gauze is not available, one can cut a number of strips of 2 inch roller bandage and apply sterile petrolatum or nitrofurazone (furacin®) to these. I usually use antibiotics for the first week as an added precaution. Over the donor area, strips of vaseline gauze are applied, and a pressure bandage similar to that on the graft is used.

When should one look at the graft? If there is no odor from the dressings and the temperature remains under 100 F., I ordinarily do not change the dressings for four to five days. However, if the dressing becomes foul or the temperature spikes to 102 to 103 F., the dressing should be very carefully removed as early as the end of 48 hours. When the dressing is changed, any pustules or blisters in the graft are opened. In case of any infection, wet dressings are immediately applied. Once the initial dressing has been changed, I always change the dressing every other day. This gives better healing. The sutures are removed on the eighth day, and usually all the bandages may be removed by the eighteenth day. On the legs, it is usually wise to apply an ace bandage for a period of three months to prevent the swelling of the leg following this immobilization. It is a good idea to have the patient apply hydrous wool fat (lanolin) or petrolatum to the graft for several months to prevent drying of the graft.

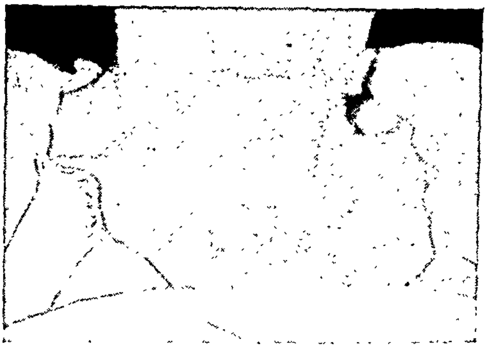

Fig. 4.—Photograph showing neck graft one year after operation.

SUMMARY

A simple method of taking and applying skin grafts is described. An attempt has been made to limit the materials used in the care and preparation to those found in any hospital or clinic.

727 W. Seventh St.

The Physician's Responsibility.—We owe it to our patients to keep our skill at its peak by practicing, in our own expenditure of physical and mental energy, the moderation which we preach to them, and by utilizing the cultural and spiritual resources afforded by wholesome recreation, reading, home life, and worship. An extensive practice is exhausting; and when we become overtaxed our medical judgment wavers, our patients are denied their rightful consideration, and we become guilty of that assembly-line type of treatment which we so greatly deplore in England.—A. M. Phillips, M.D., The Physician's Responsibility, *Journal of the Medical Association of Georgia*, April, 1951.

CLINICAL NOTES

SARCOIDOSIS DIAGNOSED BY MEANS OF SUBCLAVIAN LYMPH NODE BIOPSY

REPORT OF A CASE

Lieutenant Commander Harry A. Weiss (MC), U.S.N.; Lieutenant Commander Robert M. Campbell (MC), U.S.N.; Lieutenant Commander George C. Budenz (MC), U.S.N., and Commander Carl M. McCandless Jr. (MC), U.S.N.

This case is reported because of its interesting features and because it illustrates the use of a new diagnostic aid in confirming a clinical impression of pulmonary sarcoidosis.

Frequently a histological diagnosis of Boeck's sarcoid is impossible because there is no superficial lymphadenopathy. In a series of such cases recently reported, a method of obtaining lymph nodes or lymphoid tissue from the fat-filled space overlying the scalenus anticus muscle was described by Daniels.[1]

REPORT OF CASE

The patient, a 48 year old man, was admitted April 5, 1949 "for a check-up."

In November 1941 he had had influenza, which persisted despite the usual palliative measures. He was studied at a hospital for six weeks. Because of the chronic cough with expectoration of mucoid sputum, weight loss, fatigue, increased erythrocyte sedimentation rate and appearance of the chest roentgenogram, a diagnosis of pulmonary tuberculosis was made. Results of the sputum studies and the tuberculin test were negative. He was discharged after being advised as to diet, rest, etc. After a month he felt well and returned to his clerical work. The patient remained well except for a mild cough with expectoration of 150 ml. of greenish sputum daily and periodic night sweats. He maintained his weight. Beginning in 1943 he infrequently had blood-streaked sputum. Various physicians followed him during this period. In 1945 ease of fatigability developed, and he lost 50 pounds (22.7 Kg.) of weight in the next three years. Since 1945 he had been under constant medical supervision by private physicians, a medical school clinic, a county sanatorium and a naval hospital. During the past eight years, results of stains, cultures and inoculations of guinea pigs with sputum and bronchial washings were repeatedly negative. The patient had semiannual chest roentgenograms. He estimated that the reactions to at least 30 tuberculin tests had been negative. Reactions to the tuberculin tests performed on his wife and 10 year old son were negative. At one time Pseudomonas aeruginosa was cultured from his sputum, and he was subsequently treated with a vaccine, penicillin, sulfonamides and streptomycin, without apparent effect. He had had asthma since 1943 and obtained relief from tripelennamine (pyribenzamine®) hydrochloride. Skin tests showed sensitivity to bananas. His weight had been constant during the past year. He requested admission for a periodic check-up.

The review of systems disclosed no other abnormalities.

His past history included mumps, whooping cough and measles in childhood and a Gonococcus infection in 1925. His family history was not pertinent except for its negativity. There were no known cases of tuberculosis.

Examination showed a middle-aged man in no distress except mild shortness of breath. The temperature was 98.2 F., pulse rate 86, and respiratory rate 26; the blood pressure was 98 systolic and 64 diastolic. The trachea was deviated to the left. There was a respiratory lag throughout the left hemithorax. Breath sounds were diminished at the base of the right lung. There was dulness over Kernig's isthmus bilaterally. There were crepitant rales over the apexes of both lungs. There was moderate clubbing of the fingers. The vital capacity was 2,800 ml., 65 per cent of the calculated normal. There were no palpable lymph nodes.

Results of the Kahn blood test were negative, and the blood cell count and urinalysis were normal. The sedimentation rate of erythrocytes was 25 mm. in one hour. Serum protein was 5.7 Gm. per 100 ml., with 3.0 Gm. of albumin and 2.7 Gm. of globulin. Reaction to the histoplasmin skin test was positive; reactions to the coccidioidin and tuberculin skin tests were negative. Results of the smears and cultures of the sputum and bronchial washings were negative. The Kveim test was not performed. The electrocardiogram showed left axis deviation.

We were able to obtain chest roentgenograms dating to January 1945 from outside authorities and to compare them with current roentgenograms. The earliest showed a diffuse fibrotic infiltration occupying the upper half of the right lung field and a similar but less extensive infiltration of the left midlung field. The pleura was thickened over the apex of the right lung, and small calcifications were present within the bilateral lesions. The nodes at the root of the right lung were enlarged and were of the type sometimes described as "potato nodes." The right hilus was drawn laterally by the fibrosis. Emphysematous changes were present in both bases, and adhesions to the diaphragm and pericardium were present. Roentgenograms of July 1947 and August 1948 demonstrated bilateral progression of the lesions with infiltration into both bases. The lesions appeared softer than previously, although more calcifications had developed. The right hilus remained enlarged, and the left hilus had increased in size.

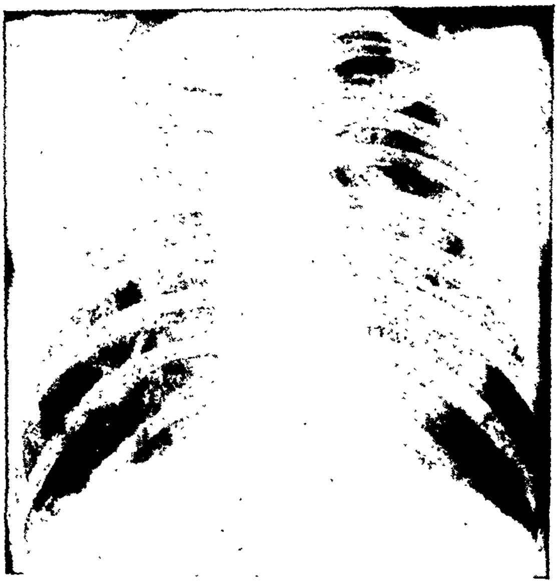

Fig. 1.—A representative chest roentgenogram view.

The examination of April 1949 showed bilateral decrease of the lesions, which were now entirely fibrotic. The right hilus

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[1] Daniels, A. C.: A Method of Biopsy Useful in Diagnosing Certain Intrathoracic Diseases, Dis. Chest **16**: 360 (Sept.) 1949.

had decreased in size, although the left hilus had remained enlarged. At no time in this series of roentgenograms was cavitation demonstrated. In view of the long series showing extensive bilateral changes of fibrosis and calcifications, but without cavitation, the presence of a chronic fungus infection should be considered, although tuberculosis must be ruled out. The calcifications were of the type described in histoplasmosis. The enlarged hilar nodes suggested sarcoidosis. Figure 1 shows a representative chest roentgenogram view.

Because of the history, the contrast between the appearance of the chest roentgenograms and the patient's clinical condition, the negative tuberculin reactions, the failure to identify bacilli in the sputum, and the negative tuberculin reactions in members of his immediate family, a diagnosis of sarcoidosis was considered. On April 19, 1949, operation was performed.

The gross specimen removed consisted of a mass, 3.0 by 1.7 by 0.7 cm., with some adherent adipose tissue on the surface. Microscopic sections revealed a lymph node with an intact thin fibrous capsule. In some areas were scattered germinal centers, which appeared normal. Irregularly distributed throughout the lymphoid tissue were tubercle-like structures, which varied in size from a single tubercle to groups of six to eight tubercles, none showing caseation necrosis. In many of these were one or more multinucleated giant cells. In the reticular tissue of the node and in several tubercles there were scattered eosinophils, and within epithelioid cells of some areas there was granular brown pigment. Diagnosis was Boeck's sarcoid of a lymph node. Figure 2 shows the typical microscopic appearance.

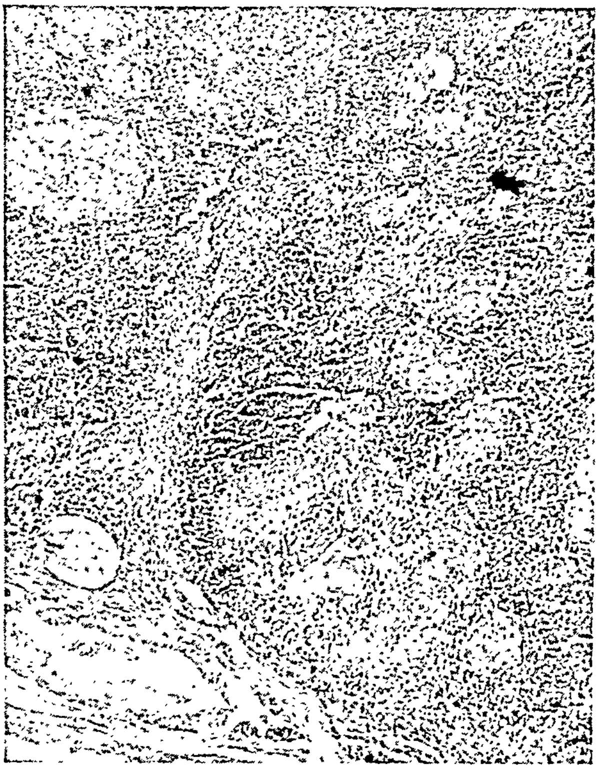
Fig. 2.—A microscopic section of lymph node.

OPERATIVE TECHNIQUE

The surgical technic employed in obtaining the biopsy specimen is essentially the same as the procedure used in doing a phrenic nerve crush. A short horizontal incision is made 1 fingerbreadth above the clavicle, extending laterally from over the lateral border of the sternocleidomastoid muscle. The incision is carried downward by blunt dissection, the lateral border of the sternocleidomastoid being retracted medially, to the scalenus anticus muscle. The scalenus anticus is then freed medially and dependently, thus exposing a space filled by a fat pad, from which the biopsy specimen is taken.

Anatomically the fat pad contains lymphoid tissue which is part of the mediastinal drainage system. If the lymph nodes are not visible grossly or palpable, a generous portion of the fat pad is removed for histological study. On the other hand, as in the case reported, the fat pad space may be filled by a large, solitary lymph node which can be freed and delivered with ease.

SUMMARY

We have presented a case that we consider to be an instance of pulmonary sarcoidosis and have illustrated a procedure that may be of assistance in establishing the diagnosis of this and other intrathoracic conditions.

HYPERVITAMINOSIS A WITH INFANTILE CORTICAL HYPEROSTOSIS

Irving E. Rineberg, M.D., New Brunswick, N. J.
and
Robert J. Gross, M.D., New York

In recent years, and particularly since the report of Caffey and Silverman in 1945, attention has been directed to what appears to be a new clinical entity found in infants. The disease has been called infantile cortical hyperostosis, or Caffey's disease.[1] At 4 to 6 months of age the patient manifests fretfulness, irritability, loss of appetite. The course is febrile or subfebrile. Painful thickenings of the upper and lower extremities associated with circumscribed, soft tissue areas of induration and swelling develop in the extremities, the head, face and the chest wall. In 1930 Roske [2] reported a closely similar syndrome. An increasing number of cases are being reported in the literature, particularly from large clinics that have reexamined their old files of pediatric films and have failed to find these changes on reevaluation of their earlier studies.[3] The conclusion, therefore, seems justified that physicians are dealing with a relatively new entity and not a condition that was previously overlooked. As the literature dealing with this peculiar generalized affection accumulates, more and more variations of the clinical picture are found, as compared with those originally described by Roske in 1930 and by Caffey in 1945. The case to be reported here is of particular interest for two reasons: (1) The age of the patient having signs and symptoms of infantile cortical hyperostosis was 33 months at the onset of illness, much older than any previous case described in the literature, and (2) the history of the case suggests that hypervitaminosis, although often minimized as a cause, may be the underlying factor.

REPORT OF A CASE

J. Z., a girl, was born Oct. 27, 1946. Delivery was normal, and the infant appeared normal at birth. Development progressed satisfactorily, except that teeth did not appear until the age of 8 months. However, at 2½ years of age she had normal dentition.

From St. Peter's General Hospital, New Brunswick, N. J. (Dr. Rineberg), and the New York Medical College, Flower and Fifth Avenue Hospitals, New York (Dr. Gross).

1. Caffey, J., and Silverman, W. A.: Infantile Cortical Hyperostosis: Preliminary Report on New Syndrome, Am. J. Roentgenol. 54: 1-16, 1945.

2. Roske, G.: A Peculiar Bone Disease in Infancy, Monatsschr. f. Kinderh. 47: 385-400, 1930.

3. Scherman, M. S., and Hellyer, D. T.: Infantile Cortical Hyperostosis, Am. J. Roentgenol. 63: 212-222, 1950.

During the winters of 1948 and 1949 she suffered numerous attacks of tonsillitis and pharyngitis that were treated with sulfadiazine and penicillin. During an office visit in November 1948 the mother remarked that she had noted flaring of the lower ribs and beading at the costochondral junctions. Questioning revealed that about six months prior to this time the dietary vitamin supplement (concentrated oleovitamins A and D, navitol®) had been discontinued. A clinical diagnosis of mild rickets was made, and the mother was advised to administer 5 drops of the vitamin preparation daily. The subsequent course of the child was apparently uneventful. On April 30, 1949, tonsillectomy was performed. Recovery was normal.

The child was not seen again until August. At that time the mother stated that she had noted swelling in and about the child's left ankle, particularly on the outer side, for two days, and that the child had complained of pain in this region and walked with a limp. Physical examination revealed only diffuse soft tissue swelling in the region of the left ankle joint. The swelling was thought to be post-traumatic, and conservative treatment was advised. The child was seen again September 12, because the pain and limp had not improved and a hard mass had become apparent on the outer side of the left leg. The child during this period had become intensely irritable. The mother had also noted soft tissue swelling of both wrists and a dusky appearance of the overlying skin. The child experienced pain on movement of the wrists and refused to pick up objects or cried when using a spoon. A swelling was present in the mandibular region of the face, and circumscribed, tender soft tissue lumps were present on the calvarium. On September 12 a roentgenogram of the left ankle (fig. 1) revealed an area of subperiosteal calcification at the lateral aspect of the distal end of the shaft of the fibula and an accompanying swelling of the adjacent soft tissues. A circumscribed soft tissue swelling was also seen in the region of the posterior triangle of the ankle. In the differential diagnosis trauma, tumor and inflammatory change were considered. During the succeeding three weeks the child was followed clinically and was observed to have frequent nose bleeds and tender elevations on the right side of her nose, the lateral surfaces of both knees and the metatarsal region of the right foot. Roentgenographic studies revealed areas of subperiosteal calcification along the margin of the left fibula and the left ulna, as well as thickening of the mandible (fig. 2). She was hospitalized October 1, and biopsy of the left fibula was performed. The incision was carried down to the periosteum, where thickening and elevation of the bone were detected. A small segment of bone extending to the medullary cavity was removed. Microscopic examination showed a strip of newly formed, poorly calcified bone of coarse fibered structure such as is usually seen in ordinary productive periositis.[4] The marrow spaces were filled with fibrous marrow containing thin walled blood vessels and many osteoclasts. Much osteoblastic activity was seen along the bone surfaces (fig. 3). Pathological diagnosis was "productive periostitis."[5]

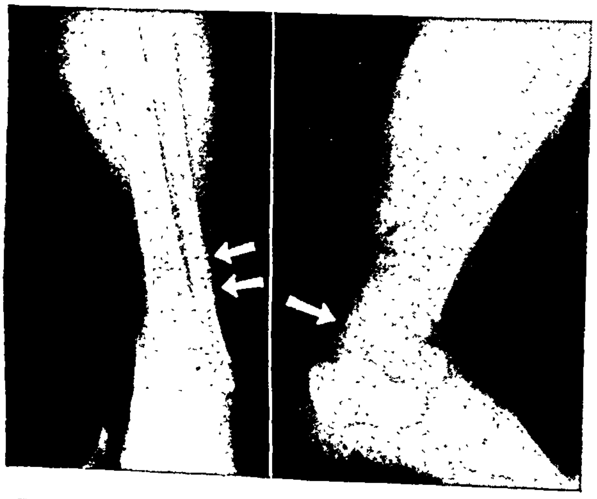

Fig. 1.—Left ankle showing area of subperiosteal calcification at the lower end of the shaft of the fibula with soft tissue swelling.

She was readmitted to the hospital October 17. She had become extremely irritable, lacking in appetite and unable to sleep. Routine laboratory studies showed the blood count to be essentially normal, hemoglobin 89 per cent, red blood cells 4,770,000 and white blood cells 7,500, with a differential of polymorphonuclear leukocytes 57 per cent, lymphocytes 42 per cent and monocytes 1 per cent. The smear was normal. The Mazzini and agglutination tests for typhoid, paratyphoid, Brucella and Proteus OX_{19} were negative. The urine was normal. She was given 40,000 units of streptomycin every four hours, and her temperature, which ranged on admission between 100 and 101 F., gradually subsided within the next six days. When the child left the hospital the irritability was less pronounced. She improved gradually thereafter and in March 1950 was completely free of symptoms. Some thickening of the leg and small, well-circumscribed, soft tissue elevations, were still noted over the base of the nose and over the calvarium (figs. 4 and 5).

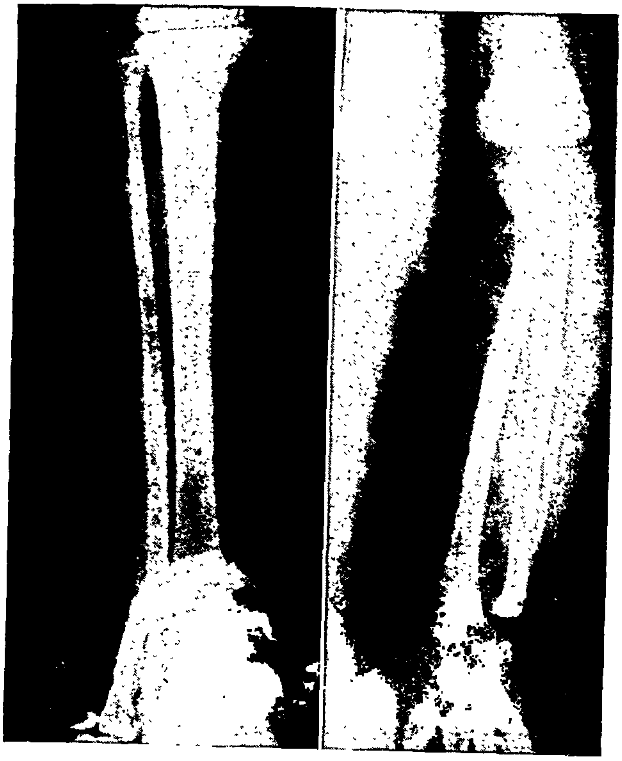

Fig. 2.—Roentgenograms of the left leg and left forearm showing extensive subperiosteal calcificatons.

COMMENT

The demonstration of subperiosteal calcifications involving a number of the long bones, correlated with the patient's clinical appearance, suggested the syndrome described as "infantile cortical hyperostosis." Although age of onset up to 18 months had been reported in the literature, the present case is noteworthy in the fact that the onset of the disease occurred when the child was 33 months old. Subsequent questioning of the mother revealed one other interesting fact. In November 1948 when the clinical suspicion of mild rickets had been entertained, 5 drops of navitol® daily were advised; however, the mother, desiring to make up the deficiency of vitamin D quickly, gave the child 1 teaspoonful of the vitamin preparation daily. This had been continued from November 1948 until August 1949, a period of nearly nine months. On recalculation it was determined that the child had received 185,000 units of vitamin A and 37,500 units of vitamin D daily.

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[4] Dr. H. Jaffe of the Hospital for Joint Diseases, New York, reviewed the roentgenograms and slide and thought them characteristic of infantile cortical hyperostosis.

[5] Pathological studies were made by Dr. Sylvan Moolten, Director of Laboratories, St. Peter's Hospital, New Brunswick, N. J.

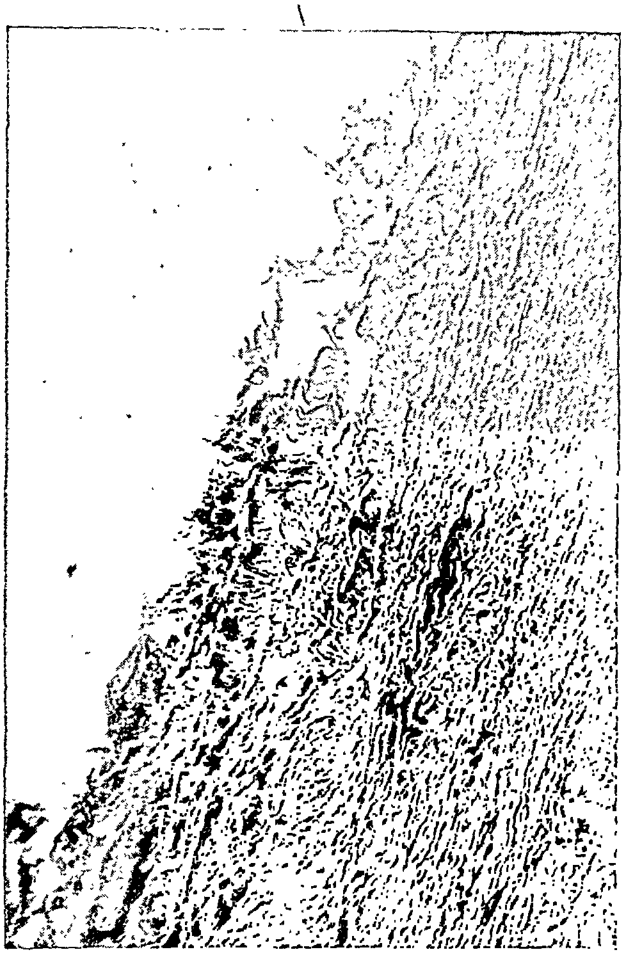

Fig. 3.—Photomicrograph of biopsy specimen showing productive periostitis.

The marked overdose of vitamin A and vitamin D is of particular interest in view of recent reports in the literature of a disease complex caused by overdose of vitamin A, which has many signs and symptoms in common with infantile cortical hyperostosis. Toomey[6] reported a 23 month old infant with bone changes similar to those found in the aforementioned case. Blood studies in this infant revealed a marked increase in the vitamin A level. The child recovered spontaneously after vitamin A was withheld. With the mother's permission, an experimental attempt to reproduce the clinical symptoms was made after the child's recovery. He was given an increased dose of vitamin A utilizing a preparation containing both A and D. The original symptoms and signs recurred. In order to rule out the possibility of vitamin D being responsible for the changes the experiment was repeated utilizing only vitamin A. This too caused recurrence of symptoms and signs.

Rothman and Leon[7] have reported two cases of hypervitaminosis A with characteristic bone changes. In their differentiation between hypervitaminosis A and infantile cortical hyperostosis they mention the age of onset, involvement of the mandible with periosteal thickening, discrepancy between the length of time of increased vitamin administration and the amount of periosteal thickening. In hypervitaminosis A the periosteal thickening in the cases they reported was slight compared with that noted in infantile cortical hyperostosis, and there was no suggestion of lamellation. In animal experiments Wolbach[8] and others have demonstrated marked effects from hypervitaminosis A and avitaminosis A in the growth and development of bone.

Another factor that has recently emerged from the literature is the occurrence of a familial tendency. Boyes and Demy[9] have described two instances in siblings and have referred to three occurrences in one family as reported by others.

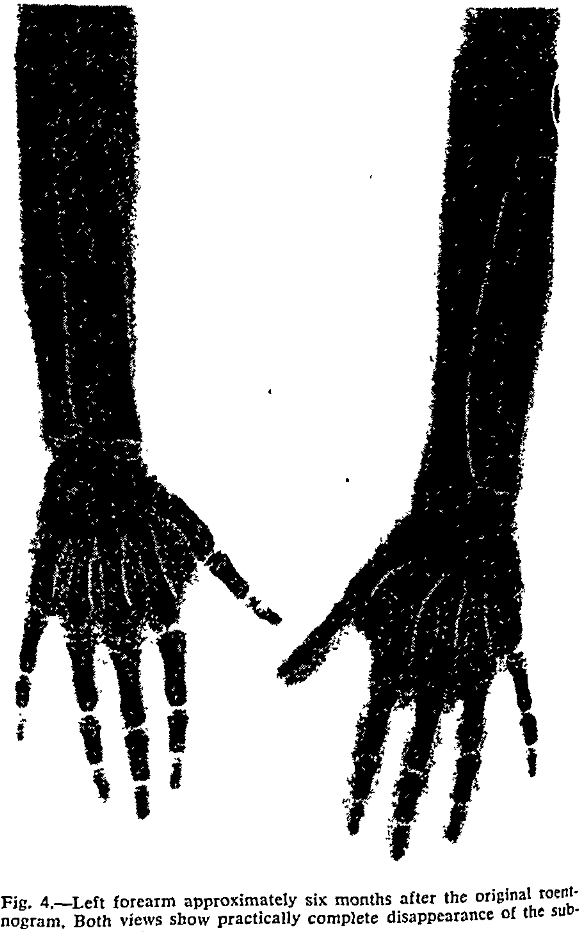

Fig. 4.—Left forearm approximately six months after the original roentgenogram. Both views show practically complete disappearance of the subperiosteal calcifications.

On the basis of these reports it appears we are dealing with a relatively new entity that, although at first confused with scurvy or syphilis, shows distinct differences. The inception of the disease historically coincides roughly with the era of increased vitamin intake in infant feeding. The occurrence of the disease in more than one member of the same family has been shown in certain instances.

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[6] Toomey, J. A., and Morissette, R. A.: Hypervitaminosis A, Am. J. Dis. Child. **73**: 473-479 (April) 1947.

[7] Rothman, B. E., and Leon, E. E.: Hypervitaminosis A: Report of 2 Cases in Infants, Radiology **51**: 368-374, 1948.

[8] Wolbach, S. B.: Vitamin-A Deficiency and Excess in Relation to Skeletal Growth, J. Bone & Joint Surg. **29**: 171-192, 1947.

[9] Boyes, J., and Demy, N.: Infantile Cortical Hyperostosis: A Familial Disease, Am. J. Roentgenol., to be published.

Animal experiments as well as clinical observations have correlated increased intake of vitamin A with certain soft tissue and bone changes. In the aforementioned case the clinical picture could not be differentiated from infantile cortical hyperostosis. The bone changes and the changes in the mandible and soft tissues were characteristic of infantile cortical hyperostosis. Improvement was dramatic after cessation of vitamin A intake. In addition to age, factors of individual or familial susceptibility to hypervitaminosis A may be important.

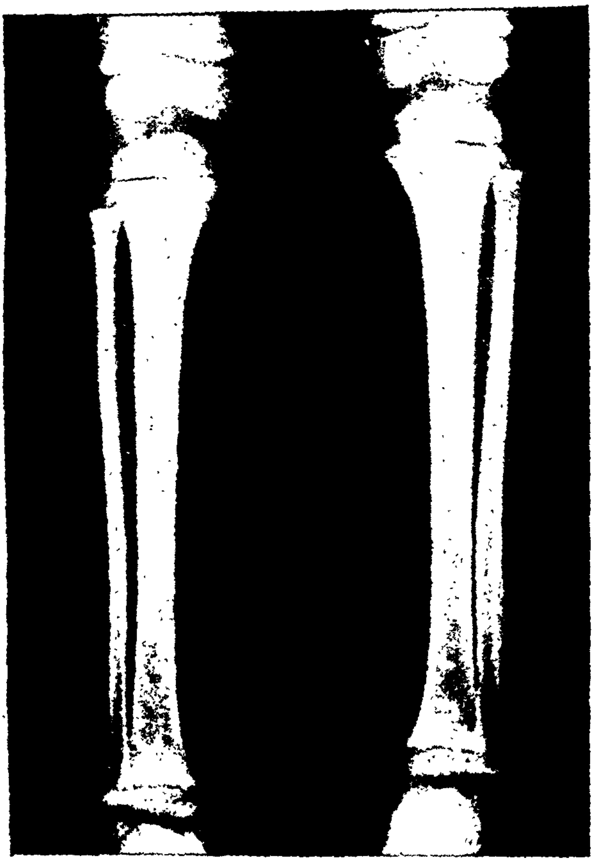

Fig. 5.—Left leg approximately six months after the original roentgenogram. Both views show practically complete disappearance of the subperiosteal calcifications.

Definite correlation between vitamin A overdose and this syndrome awaits the result of vitamin A balance studies.

CONCLUSION

A case is described in which the typical signs and symptoms of infantile cortical hyperostosis developed at the age of 33 months with history of excessive vitamin A intake.

Public Relations.—Every time you look at yourself in a mirror, you should be reminded that, for your patients, you are the medical profession. Your concern for their welfare, your self-sacrificing service to them, and your ethical relations with your colleagues will have more weight with your public than full-page advertisements in every newspaper in the country. It is up to you, not to the professional public relations experts hired by medical organizations, to interpret the views of the medical profession to the public, and to prove to them our sincere desire to give them the best medical care possible under any conditions. —A. M. Phillips, M.D., The Physician's Responsibility, *Journal of the Medical Association of Georgia*, April, 1951.

SUCCESSFUL TREATMENT OF DERMATITIS DUE TO CHRYSOTHERAPY WITH ADRENOCORTICOTROPIC HORMONE

Charles LeRoy Steinberg, M.D.
and
Andries I. Roodenburg, M.D., Rochester, N. Y.

The fact that both adrenocorticotropic hormone and cortisone cause a remission of rheumatoid arthritis in nearly every instance in which they are employed has been most encouraging to those treating the disease. No known previous medication could be so successfully used. However, it is becoming a well-known fact that neither of these two hormone substances cure rheumatoid arthritis. They dampen without extinguishing the fire. No such spectacular results are obtained with chrysotherapy. Complete remissions in well-established cases of rheumatoid arthritis with gold treatment occur in about 20% of treated persons. The remission, if it is obtained, is much more permanent than that with the hormone preparation. Chrysotherapy will be continued in the treatment of rheumatoid arthritis because of these facts. Also if gold therapy is continued, then the various complications associated with its treatment will be encountered. The most frequent complication of gold treatment is dermatitis. The following is a case of gold dermatitis due to chrysotherapy that was successfully treated with adrenocorticotropic hormone.

REPORT OF A CASE

Mr. A. E. S., 41, was first seen April 3, 1950, at which time he complained of painful swollen hands. He first began to have pain in the shoulder joints in the summer of 1949. At that time he was unable to raise his arms. Painful swelling developed in the small joints of the hands, wrists, and knees during the winter of 1950. At first the joint symptoms were migratory but later became localized within the joints. His past history revealed that he had had jaundice some years ago. The tonsils were removed during childhood.

Physical examination revealed a well-nourished white man whose nude weight was 189 lbs. (85.7 Kg.), height 5 ft. 11 in. (180.34 cm.), temperature 98.2 F., pulse 80, and blood pressure 120/80. The pupils reacted to light and accommodation. The teeth appeared normal, but roentgenograms were suggested. The tonsils were absent, and the posterior pharynx seemed normal. Examination of neck, lungs, heart, and abdomen revealed no abnormalities. External genitalia were normal. The prostate was normal in size and consistency. There was soft tissue swelling of the third and fifth right and the first and fifth left proximal interphalangeal joints and the third left metacarpophalangeal joint. There was swelling of the right infrapatellar bursa. The deep reflexes were equal and active, and the vibratory sense was intact.

Urinalysis was normal except for a heavy trace of sugar. Red blood count was 5,200,000; hemoglobin 14.2 Gm.; white blood count 10,500. Differential count revealed stab cells 2%, segmented cells 65%, lymphocytes 23%, monocytes 5%, and eosinophils 5%. The sedimentation rate was increased to 21 mm. per hour. The blood uric acid was normal at 3.4 mg. per 100 cc. Throat culture revealed 75% Streptococcus viridans organisms. Electrocardiogram was normal. Roentgenograms of the hands

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Director of Arthritis Clinic, Rochester General Hospital (Dr. Steinberg).

taken March 18, 1950, showed a distinctly decreased joint space in the fifth left proximal interphalangeal joint. Antistreptolysin titer was 400 units. Wassermann test was normal. Diagnosis of rheumatoid arthritis was made.

He was placed on 25 mg. of gold sodium thiomalate (myochrysine®) intramuscularly at weekly intervals. The sedimentation rate on May 17, 1950, was 38 mm. per hour and on June 28, 1950, was 20 mm. per hour. There was general improvement in the joint symptomatology on June 28, 1950. There was 50% less swelling noticed in the right knee joint. Gold treatment was stopped on June 21, 1950, because of an itchy sensation on both forearms and over the dorsum of both hands. He was next seen Aug. 16, 1950, and had had no gold treatment since June 21, 1950. On this date red blood count was 4,860,000; hemoglobin 14 Gm.; white blood count 7,900. Differential count was as follows: stab cells 3%, segmented cells, 52%, lymphocytes 31%, monocytes 4%, eosinophils 10%, and basophils 1%. The platelet count was 295,000 per cu. mm. Bone marrow aspiration revealed megakaryocytes, normal erythropoiesis and myelopoiesis, but pronounced eosinophilia. There were 4 to 8 eosinophils per high power field. The sedimentation rate had dropped to 14 mm. per hour. Skin itching was still present, but no rash was noted. All joint swelling had disappeared, but he still had some pain in several of the major joints, particularly the right wrist. He was next seen Sept. 19, 1950, at which time he reported that he had a rash on his legs, forearms, back, and thighs of one week's duration. It was interesting that his last gold treatment was on June 21, 1950. On September 19, his blood studies were as follows: red blood count 5,110,000; hemoglobin 15.6 Gm., and white blood count 7,650. Differential count revealed stab cells 2%, segmented cells 53%, lymphocytes 24%, monocytes 6%, eosinophils 14%, and basophils 1%. The sedimentation rate was normal at 13 mm. per hour. The platelet count rose to 325,000 per cu. mm. Because of the extensiveness of the rash due to gold therapy (fig. 1), he was admitted to the Rochester General Hospital, and adrenocorticotropic hormone was started.

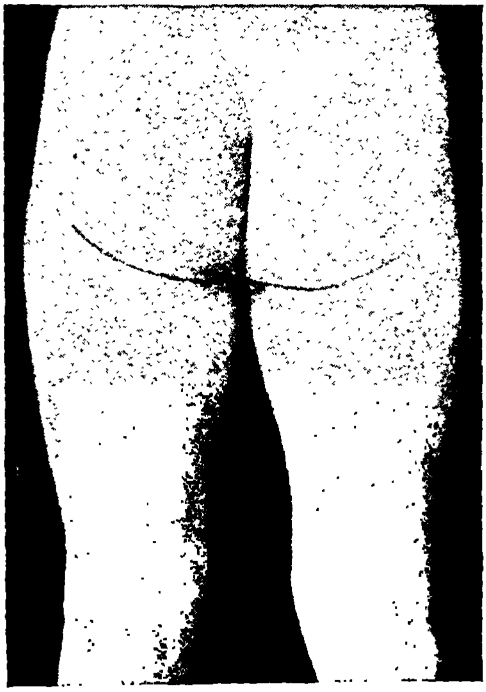

Fig. 1.—Dermatitis due to gold therapy before treatment with adrenocorticotropic hormone.

Photographs were taken immediately of the rash, and then he was placed on 15 mg. of adrenocorticotropic hormone every six hours. Only slight response was obtained to the degree of erythema of the skin rash, and so on Sept. 22, 1950, adrenocorticotropic hormone was increased to 20 mg. every six hours and the patient was kept on this dose until Sept. 29, 1950. Two days after this higher dosage was started, the skin rash began to fade noticeably. The redness of this rash had faded 50%, and the raised surface had disappeared. There was only slight improvement in the degree of itching. On Sept. 24, 1950, itching was considerable, and there was little change in the rash. We thought of discounting adrenocorticotropic hormone and giving dimercaprol (BAL) instead. However, there was subsequent and progressive improvement in the rash, and by Sept. 29, 1950, the rash had completely disappeared, but skin itching remained resulting from unusual dryness following the rash (fig. 2). On the latter date (September 29), the dosage of adrenocorticotropic hormone was gradually decreased as follows: 15 mg. every six hours for four doses, 10 mg. every six hours for four doses, 5 mg. every six hours for four doses, then 5 mg. every 12 hours for two doses. At this point adrenocorticotropic hormone was discontinued. The patient was observed for two more days and was discharged from the hospital when the rash did not reappear.

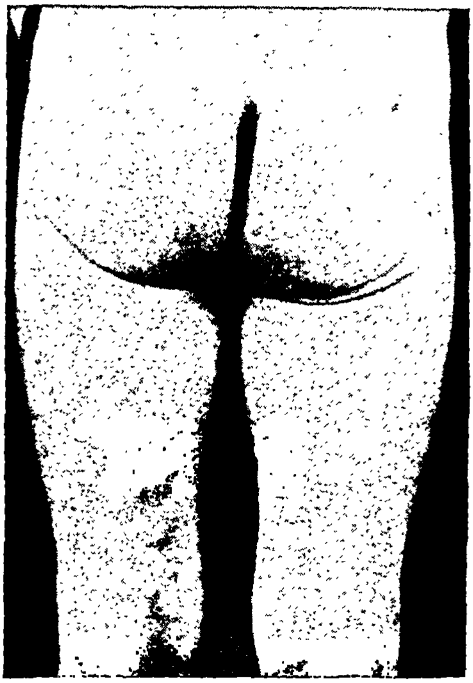

Fig. 2.—Complete disappearance of rash due to gold therapy after nine days of adrenocorticotropic hormone treatment. Skin has residual dryness and slight scaling.

These laboratory studies were done, and the following results were obtained: On Sept. 21, 1950, red blood count was 5,700,000; hemoglobin 16.8 Gm., and white blood count 6,700. Differential count indicated stab cells 6%, segmented cells 52%, lymphocytes 27%, monocytes 9%, and eosinophils 6%. Urinalysis was normal. Blood serology revealed no abnormalities. On Oct. 2, 1950, blood chlorides were 470 mg. per 100 cc., fasting blood sugar 84 mg. per 100 cc., and sedimentation rate 16 mm. per hour. On the same date, blood sodium was 147 mEq. per liter (338 mg. per 100 cc.) and blood potassium 4.1 mEq. per liter (16 mg. per 100 cc.).

SUMMARY AND CONCLUSIONS

Adrenocorticotropic hormone was successful in the treatment of extensive dermatitis due to gold therapy. This hormone treatment is more effective and certainly more pleasant than dimercaprol for this condition.

Medical Arts Bldg., 277 Alexander St. (Dr. Steinberg).

PIPEROXAN HYDROCHLORIDE (BENZODIOXAN) TEST

REPORT OF A FALSE POSITIVE REACTION

Virgil A. Place, M.D., Chicago

The response to piperoxan hydrochloride (benzodioxan) was first described as a diagnostic test for patients with sustained hypertension associated with pheochromocytoma in THE JOURNAL in 1947.[1] Since that time, the test has been generally accepted. The rational use of this drug is based on its specificity for blocking circulating epinephrine, arterenol (norepinephrine) or related compounds. Patients with hypertension of other than the above origins have shown either no alteration or an elevation of the blood pressure when piperoxan hydrochloride has been given intravenously.[2] There have been three cases reported of patients who demonstrated a normal response to the piperoxan hydrochloride test and were later shown to have pheochromocytomas.[2d]

I have been able to find only one case of an unautopsied patient who was reported by Taliaferro to have false positive tests.[3] The diagnosis of renal hypertension in this case, however, has been questioned.[2d]

The case reported here is of interest because of the unusual results of several piperoxan hydrochloride tests.

REPORT OF CASE

History.—J. G. S., a 25 year old white, married college student, entered the hospital on Aug. 14, 1950, as a possible candidate for therapy with an artificial kidney. Seven years before admission, while in the United States Navy and stationed at Chicago, he was diagnosed as having scarlet fever but at the time had no known complications. Two years later, while still in the Navy, he had one episode of painless gross hematuria. He was hospitalized for a single day. One year later, in 1946, he suffered another episode of hematuria, associated with infectious mononucleosis, for which he was hospitalized three weeks. The patient knew of no abnormality of his urine or blood pressure after this, until November 1949, at which time, after an episode of nausea, vomiting, and frontal headache, he was found to have a systolic blood pressure of 250 mm. of mercury. He progressed to a state of coma, but, after three weeks of hospitalization, recovered sufficiently from the episode of encephalopathy to return to college. Subsequently, he was relatively free of symptoms until the week prior to this admission, when he suffered a recurrence of the nausea, vomiting, and headache.

In the physical examination given at admission, the patient's temperature was 99 F.; pulse, 92; respirations, 20; blood pressure, 240/130; weight, 154 pounds. He was a young, thin, white, well developed, alert man, who appeared chronically ill. He hiccoughed frequently but had no dyspnea nor orthopnea. Although he complained of generalized pruritus, he had no dermatitis or icterus. His throat showed no remarkable abnormality, and no lymphadenopathy was present. The optic fundi showed marked spasm, increased light reflex and blurred disc margins without exudates or hemorrhages. His heart was not enlarged, the sounds were loud, and no cardiac murmurs were heard. The abdomen was soft, the kidneys were not palpable, and a nontender liver edge was felt at the costal margin, with no other masses noted. There was no anasarca, peripheral swelling or ankle edema.

Laboratory examinations revealed a hematocrit level of 34 per cent; the hemoglobin was 11.5 Gm., with a red blood cell count of 3,570,000. The white cell count was 7,300, with a normal differential distribution. The Kahn reaction was negative. The urine had a specific gravity of 1.005 and contained protein (4 +). The sediment contained 2 to 10 white cells, 12 to 20 red cells, and 2 to 5 hyaline and cellular casts per high powered field (in centrifuged specimen). The phenolsulfonphthalein excretion was 10 per cent in two hours. Chest x-rays showed cardiac and pulmonary shadows within normal limits. The electrocardiogram showed evidence of left ventricular preponderance. The venous pressure was 210 mm. of saline, with a normal hepatojugular reflex. A circulation time with ether was 15 seconds, and with dehydrocholic acid (decholin®), 23 seconds. His blood nonprotein nitrogen was 78 mg. per 100 cc. and the carbon dioxide, 25.2 milliequivalents per liter. A test made with amobarbital (amytal®) sodium on the second day of admission, with a dose of 0.4 Gm. orally, produced a rise in blood pressure from 200/140 to 220/160 mm. of mercury in three hours.

Within 24 hours after admission, the patient became disoriented, semistuporous and nonresponsive. He was given 16 Gm. of magnesium sulfate intramuscularly in the ensuing 24 hours, and several infusions of 50 per cent dextrose intravenously. His mental status improved to the point of his responding upon hearing his name, and he seemed to regain his appetite, although eating caused nausea and vomiting. A spinal puncture revealed normal cerebrospinal fluid under a pressure of 360 mm.

The following day, disorientation returned and persisted throughout his course. He became incontinent of urine, but peripheral neurological examination remained within normal limits. His temperature spiked to 101.2 F. Grade 3 systolic aortic and mitral murmurs developed within 48 hours after admission; by the sixth day a coarse systolic aortic thrill and fresh retinal hemorrhages were noted. Although five blood cultures taken during these first few days remained sterile, in view of a persistent hyperpyrexia and the changing cardiac murmurs he was treated with penicillin procaine for aqueous injection, 3,000,000 units a day, but without change of status. Although the fluid intake and output remained high throughout his course, the uremia became increasingly severe.

On the fourth hospital day, he was given 0.1 mg. of protoveratrine[4] intravenously over a period of two minutes. The serial blood pressure recordings showed little change in pressure, and no alteration in mental status was noted. The protoveratrine test was repeated on the sixth hospital day, on which 0.15 mg. was administered intravenously; there was a consequent decrease of blood pressure from 206/140 to 190/130. A third trial with this drug, which was given in a dose of 0.18 mg. on the eighth hospital day, produced a decrease in blood pressure from 240/130 to 200/116.

On the sixth hospital day, a piperoxan hydrochloride test was performed. Twenty mg. of the drug, given over a period of two minutes into an intravenous clysis that had been running at least one hour, produced a drop in blood pressure from 240/132 to 220/110 and a return to normal within 8 minutes (fig. 1).

This study was supported by funds from the Otho S. A. Sprague Memorial Institute.

Clinical Assistant in Medicine (Rush), University of Illinois College of Medicine, and Fellow in Medicine and Biochemistry, Presbyterian Hospital.

From the Rush Departments of Medicine and Biochemistry of Presbyterian Hospital and the University of Illinois College of Medicine. Drs. James A. Campbell, George Hass, I. Rochlin, and Henry Tesluk, and Miss Margaret Panos assisted in the preparation of this work for presentation.

[1] Goldenberg, M.; Snyder, C. H., and Aranow, H., Jr.: New Test for Hypertension Due to Circulating Epinephrine, J. A. M. A. **135**:971 (Dec. 13) 1947.

[2] (*a*) Drill, V. A.: Reactions from the Use of Benzodioxane (933F) in Diagnosis of Pheochromocytoma, New England J. Med. **241**:777, 1949. (*b*) Calkins, E.; Dana, G. W.; Seed, J. C., and Howard, J. E.: On Piperidylmethyl-Benzodioxane (933F), Hypertension, and Pheochromocytoma, J. Clin. Endocrinol. **10**:1, 1950. (*c*) Grimson, K. S.; Longino, F. H.; Kernodle, C. E., and O'Rear, H. B.: Treatment of a Patient with a Pheochromocytoma: Use of an Adrenolytic Drug Before and During Operation, J. A. M. A. **140**:1273 (Aug. 20) 1949. (*d*) Goldenberg, M., and Aranow, H., Jr.: Diagnosis of Pheochromocytoma by the Adrenergic Blocking Action of Benzodioxan, J. A. M. A. **143**:1139 (July 29) 1950. (*e*) Koffler, I.; Buck, G.; Wingard, C.; Hitchcock, P.; Guthrie, R., and Teague, R. S.: A Case of Pheochromocytoma: Diagnoses by Benzodioxane Test, Urinary Hormone Studies, and Nor-Epinephrine Assay of the Tumor, J. Clin. Endocrinol. **10**:897, 1950.

[3] Taliaferro, I.; Adams, R. A., and Haag, H. B.: Benzodioxan Test, J. A. M. A. **140**:1271 (Aug. 20) 1949.

[4] Protoveratrine was furnished through the courtesy of E. Meilman, M.D., Beth Israel Hospital, Boston.

Because of the suggestive results of this test, the following morning it was repeated and the same technique was used. A drop in blood pressure from 240/140 to 182/108, with a return to normal 10 minutes after cessation of administration, was observed. Because of these two responses, a third test was planned. It was decided to try to maintain the decreased pressure by intermittent administration of piperoxan hydrochloride. After a total dose of 80 mg. had been given in a period of 20 minutes, with a drop in blood pressure from 240/138 to 158/72, marked cerebral stimulation developed in the patient, resulting in thrashing movements of his arms, attempts to sit up, retching, and moaning; therefore the drug was stopped.

The following morning the test was again repeated, the standard technique being used, and there was a fall in blood pressure from 220/130 to 206/118.

By the ninth hospital day, the blood nonprotein nitrogen was 156 mg. per 100 cc., chlorides were 79, and carbon dioxide 3.5, milliequivalents per liter; phosphorus, 114.8 mg. per 100 cc.; sodium, 125 milliequivalents per liter and potassium, 3.0 milliequivalents per liter. Urinary excretion throughout hospitalization averaged 1,770 cc. a day, with specific gravities ranging from 1.005 to 1.017 and protein contents of 4 Gm. a day. Phenolsulfonphthalein excretion through a retention catheter was less than 5 per cent in two hours, with a volume of 340 cc. When 8.9 Gm. of sodium chloride was given intravenously, 6.1 Gm. was excreted in the next 24 hours. Fluid intake throughout hospitalization averaged 2,590 cc. a day and was maintained by intravenous infusions consisting mainly of 20 per cent dextrose

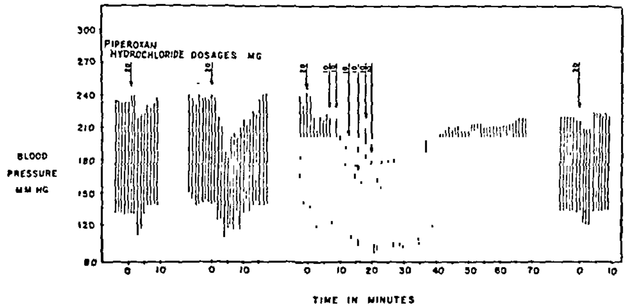

Fig. 1.—Composite graph of the piperoxan hydrochloride tests done during a period of 48 hours.

Because of the marked, yet variable, response shown to the piperoxan hydrochloride tests, and in spite of the terminal state, a perirenal air insufflation was undertaken, but no adrenal tumor was seen. The final two days of the illness were accompanied with progressive increase in temperature and deepening coma, and the patient died on his twelfth hospital day.

Autopsy was performed four hours after death. The heart weighed 519 Gm. There was generalized myocardial hypertrophy. The valves appeared normal. No evidence of pericarditis or bacterial endocarditis was found. The lungs showed an aspiration pneumonia that was most pronounced in the lower lobes.

The right kidney weighed 140 Gm. The left kidney, of similar size, was surrounded by a layer of recently clotted blood that was 4 cm. thick. This hemorrhage apparently had occurred as a result of the perirenal air insufflation done the day before. The capsule of each kidney was tightly adherent and, when removed, revealed a granular, yellowish-brown surface. The findings on section and microscopic examination were typical of an active chronic glomerulonephritis with marked arteriolosclerosis. Few normal glomeruli remained. Most were completely fibrosed. Capsular proliferation was conspicuous. There was a prominent degree of interstitial fibrosis and infiltration with chronic inflammatory cells, especially in the cortical regions, with small, focal abscesses in the medullary portion. The vessels were normal, except for hyalinization of the smaller arterioles (fig. 2).

The adrenals were normally located, the right weighing 6.8 Gm. and the left, 8.5 Gm. They were not irregularly shaped or abnormal in color. No tumor was found. Microscopic examination showed a few focal areas of hyperplasia in the cortex. The medullary-arteriolar system showed a remarkable degree of hyalin thickening of the walls, with an exaggerated endothelial proliferation. In places, necrosis of arterioles had led to local reparative reactions of an unusual type (fig. 3).

No extra-adrenal chromaffin tissue could be found, despite a thorough search of the abdomen and thorax.

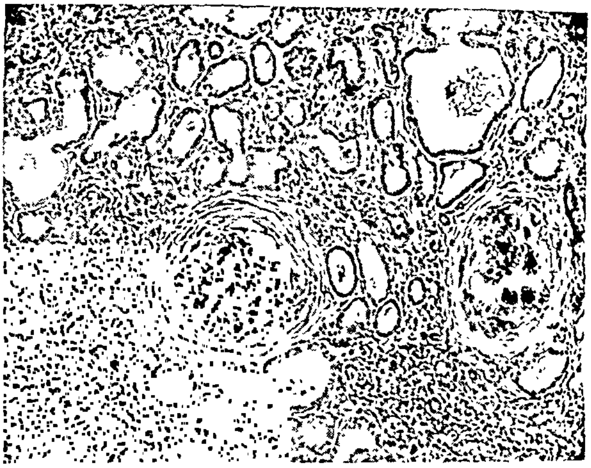

Fig. 2.—Photomicrograph of typical renal lesions.

The brain weighed 1,550 Gm., with no evidence of hemorrhage, and no tumor was found on sectioning. Microscopic study showed an extreme degree of advanced arteriolosclerosis throughout the brain.

COMMENT

Four tests with piperoxan hydrochloride were performed within a period of 48 hours, and a total of 140 mg. of the drug was administered. Side effects were noted only when 80 mg. of this drug was given in 20 minutes, and these reactions were a mild degree of cerebral stimulation.

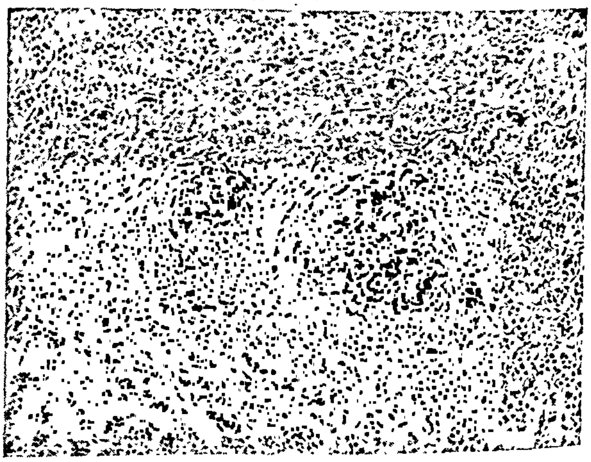

Fig. 3.—Photomicrograph of adrenal medulla, showing severe arteriolosclerosis with necrosis and inflammatory reaction.

Because of a possible cross reaction, no barbiturates were given for 72 hours prior to the piperoxan hydrochloride tests. The extent of fall in blood pressure in the reports of positive piperoxan hydrochloride tests, in patients later proved to have pheochromocytomas, has varied from 22 mm. of mercury, systolic, and 18 mm. of mercury, diastolic, to 120 mm. of mercury, systolic, and

90 mm. of mercury, diastolic. The duration of these responses ranges from 10 to 60 minutes.[5]

In this case, both the duration and the degree of hypotensive response showed wide variation, but by the above criteria all the tests were interpreted as positive. Other patients with essential and renal hypertension have been tested with the same lot of piperoxan hydrochloride used on this patient and have not shown positive reactions.

A definite negative reaction was obtained with the amobarbital sodium test, and there was only a minimal response to large doses of protoveratrine by this patient.

From the time that this patient was first seen, he was in critical condition. His story was consistent with chronic glomerulonephritis, showing marked decrease in renal function, proteinuria and chronic severe hypertension with encephalopathy. His course was one of progressive increase in azotemia, despite adequate caloric and fluid intake and a large urinary volume. Because his primary difficulty was the hypertensive encephalopathy, he was not considered a satisfactory candidate for hemodialysis with the artificial kidney. Although the hypertension was not of a paroxysmal nature, the piperoxan hydrochloride test was performed despite the severe side reactions described by some observers.[6]

The marked variability of the response is a problem, and in the report by Taliaferro [3] the variations showed a progressive decrease, while this case showed no such consistent pattern and the first test evoked a response similar to the fourth.

Because of the apparent false positives reported in piperoxan hydrochloride tests, special care was taken at the autopsy to locate a possible site of excess epinephrine production, but none was found.

The absence of an adrenal tumor and of any abnormal, extra-adrenal chromaffin tissue leaves the cause of the positive piperoxan hydrochloride test unexplained. It is possible that the false positive test has no explanation, but it is worthwhile to emphasize that there was a very severe degree of arteriosclerosis in the adrenal medulla. Ordinarily, in patients with hypertension and generalized arteriolosclerosis, the capsular and subcapsular arterioles show conspicuous changes, but medullary arteriolar disease is generally minimal. Any means by which these changes might alter medullary function and thereby lead to a false positive piperoxan hydrochloride test is unknown.

SUMMARY

A positive piperoxan hydrochloride (benzodioxan) test in a case of chronic glomerulonephritis with hypertensive encephalopathy is reported. The only pathological finding that differed from those generally encountered in other patients with cardiovascular renal disease of similar character was that of the severe arteriolosclerosis in the adrenal medulla. The variation in the response to the drug and the large dose used in one test are discussed. Two other tests of use in the study of hypertension, the amobarbital sodium and protoveratrine tests, gave negative results.

ADDENDUM

Since this paper was submitted, Goldenberg, in his paper entitled "Adrenal Medullary Function," [7] mentioned "four false positives" in which a positive response to benzodioxan was present in cases of hypertensive vascular disease with uremia. No detailed information was included.

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[5] (*a*) Goldenberg, Snyder and Aranow.[1] Koffler and others.[2e] (*b*) Wilkins, R. W.; Greer, W. E. R.; Culbertson, J. W.; Halperin, M. H.; Litter, J.; Burnett, C. H., and Smithwick, R. H.: Extensive Laboratory Studies of a Patient with Pheochromocytoma Before and After Successful Operation, Arch. Int. Med. **86**:51 (July) 1950. *N.b.*—Addendum 32 herein mentions a third case of pheochromocytoma with a depressor reaction. (*c*) Cahill, G. F.: Pheochromocytomas, J. A. M. A. **138**:180 (Sept. 18) 1948.

[6] Drill.[2a] Green, D. M., and Peterson, E. M.: Hypertensive Encephalopathy After Administration of Benzodioxan, J. A. M. A. **142**:408 (Feb. 11) 1950.

[7] Goldenberg, M.: Adrenal Medullary Function, Am. J. Med. **10**:627 (May) 1951.

WATERHOUSE-FRIDERICHSEN SYNDROME

REPORT OF CURE EFFECTED WITH CORTISONE

L. Roy Newman, M.D., Philadelphia

This pediatric case report is presented for the interest involved in the cure of an apparently hopeless case of an acute and overwhelming meningococcemia and for the therapy instituted.

REPORT OF A CASE

D. M., a 4-year-old white girl, was admitted to the children's pavilion of the Jewish hospital, service of Dr. Robert A. Schless, on Dec. 23, 1950. She had been well until two weeks prior to admission, when she had a severe upper-respiratory-tract infection, from which she recovered completely in a few days. Early in the morning of the day of admission she awoke and was feverish and irritable, and she drowsed all afternoon. By 4 p. m. she was semistuporous. She was referred to this hospital when the attending physician was called and found a generalized petechial rash. On admission the patient was seen to be an acutely ill, semicomatose, lethargic, and irrational child lying limply in bed. A massive petechial and ecchymotic rash was seen breaking out over the entire body. The temperature was 107.5 F., the pulse rate 150 a minute, and the blood pressure 70 mm. of mercury systolic and 40 diastolic. Many subconjunctival hemorrhages were seen. The heart and lungs were normal on examination. The liver was palpable, 1 fingerbreadth below the right costal margin. There was nuchal rigidity 2 + and positive Kernig's and Brudzinsky's signs were elicited. The patient had not voided for six hours prior to admission. A lumbar puncture yielded crystal clear fluid, which contained no cells. The therapy immediately instituted consisted of oxygen, aqueous adrenal cortex extract, a blood transfusion and fluids administered intravenously, sulfadiazine (1½ grains [0.1 gm.] per pound [0.5 Kg.] of body weight) administered intravenously and 1,000,000 units of penicillin in aqueous solution every four hours. The carbon dioxide-combining power was 44 vol. per cent, the serum chlorides 607 mg. per 100 cc., and the blood urea nitrogen 33 mg. per 100 cc.

The blood count showed 37,000 leukocytes, of which 95% were polymorphonuclear.

Within a few hours the blood pressure had dropped to 50 mm. of mercury systolic and 0 diastolic; cyanosis occurred, and the pulse rate rose to 200 a minute. The rectal temperature had fallen to 97 F. Shortly thereafter the patient began to vomit much digested blood and pass tarry liquid stools. She had voided only 30 cc. since admission, six hours before. At that time it was decided to attempt to support and rest the obviously failing adrenals, attempting thereby to reduce the normal vascularity in an effort to abort any active or potential hemorrhage, by giving cortisone intravenously. The patient received 75 mg. immediately and 75 mg. six hours later and then 25 mg. four times daily thereafter for the next three days. By 9 a. m. on the day after admission she responded to

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From the Jewish Hospital.

some questions and called for her mother. The temperature rose to 101 F., the pulse was 150 a minute, and the blood pressure 75 mm. of mercury systolic and 40 diastolic. She voided 380 cc. of cloudy urine in those nine hours.

Gross hematuria and crystalluria occurred after 24 hr., and the sulfadiazine was discontinued and penicillin continued alone, in conjunction with fluids given intravenously, oxygen, small transfusions, vitamins, and 25 mg. of cortisone which, after the above schedule, was given intravenously twice daily for two days and then once daily for two days.

In 24 more hours the urine was clear, and the temperature was stable at 101 F. The pulse rate was 130 a minute, and the blood pressure was 90/60. The patient was alert, slept soundly at intervals, and voided 1900 cc. on that day. Some edema and fulness of the face were present on the third and fourth days, but these disappeared a few days later. A low-grade fever persisted for a total of five days, but then the temperature dropped to normal. Biotherapy was stopped on Dec. 31, 1950. On Jan. 10, 1951, the patient was discharged, completely well, with only a few petechial crusts on the thighs and legs.

York and Tabor Rd.

METASTASIS TO THE PENIS FROM CARCINOMA OF THE RECTUM

Richard B. Cattell, M.D.
and
Albert J. Mace, M.D., Boston

Malignant involvement of the penis, either metastatic or by direct extension from a carcinoma of the rectum, is exceedingly rare. In a recent review of the literature Thompson [1] found only three cases reported and added one case of his own. In two of the three cases reported the presenting symptom was urinary retention caused by obstruction of the urethra. In the third case the presenting symptom was priapism. Examination revealed metastatic adenocarcinoma of the penis from a primary adenocarcinoma of the rectum in each case. The rectal lesion in these three instances was inoperable, and all three patients were dead from metastatic carcinoma in three to five months. In the fourth case a penile lesion developed subsequent to the resection of the rectum for adenocarcinoma. Priapism was the presenting symptom. This patient died 10 months after amputation of the penis.

Because of the rarity of this condition and the fact that in the previously reported cases no patient has survived over 10 mo., a fifth case is reported. In this case metastatic adenocarcinoma of the penis developed two and one-half years after an abdominoperineal resection for adenocarcinoma of the rectum, and the patient is alive and well nine years after excision of the penile lesion.

REPORT OF CASE

The patient was a 30-year-old white man who complained of rectal bleeding of nine months' duration. At the onset the bleeding was only occasional, but in the later period it occurred with every bowel movement. Proctoscopic examination by a local physician revealed a tumor in the rectum. The pathologist's report on a biopsy specimen was papillary adenocarcinoma, and the patient was referred to the clinic for surgical treatment.

Physical examination findings were normal except for the rectum. There was a fungating rectal tumor 4 cm. in diameter on the left lateral wall, 2 cm. proximal to the mucocutaneous line. The lesion did not appear fixed.

An abdominoperineal resection was performed on Sept. 20, 1938. Abdominal exploration disclosed neither metastases nor extension of the lesion. The lesion was well below the peritoneal reflection, and it was impossible to palpate it from above. When the rectum was freed down to the levator muscles, there was some adherence of the lateral rectal wall to the surrounding tissues but no apparent extension of the tumor into these tissues.

The postoperative course was entirely uneventful, and the patient was discharged, with no complications, on the 22d day after operation.

The pathologist's report was adenocarcinoma, with no blood vessel invasion and eight normal lymph nodes (fig. 1).

From the date of discharge the patient got along very well. The colostomy functioned adequately, and potency was normal. A child was born 18 mo. after the abdominoperineal resection. The patient was able to work and continued to live an entirely normal life. On Feb. 17, 1941, however, he returned to the clinic complaining of priapism associated with severe pain for the past several weeks. Examination findings at that time were entirely normal except for the penis. There was a firm rounded longitudinal mass approximately 5 cm. long and 2 cm. in diameter, on the left side of the penis at the level of the scrotum. This mass was adherent and suggestive of recurrent metastatic carcinoma, even though this was thought to be an unusual site for a metastatic lesion from the rectum. Consequently, the patient was advised to enter the hospital for a biopsy and frozen section study.

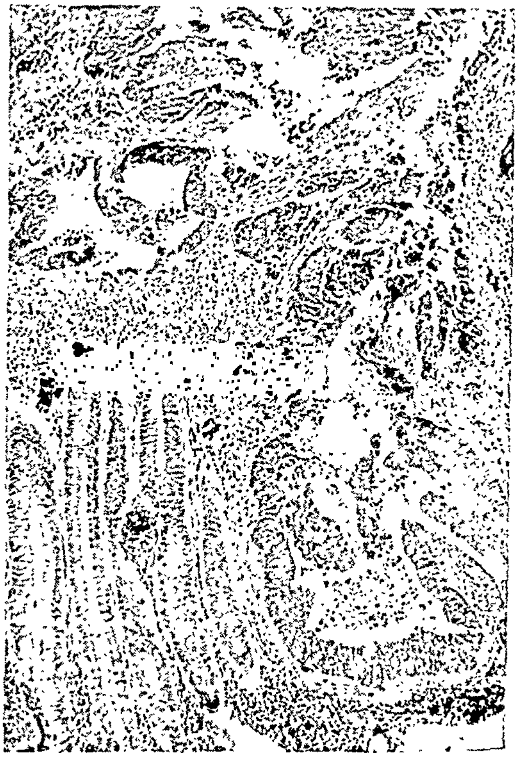

Fig. 1.—Section of adenocarcinoma of the rectum.

At operation, Feb. 18, 1941, the posterior third of the left corpus cavernosum was found to be involved in a hard fusiform tumor mass measuring about 5 cm. long and 2.5 cm. wide. Biopsy and frozen section proved this to be a metastatic carcinoma arising from the rectum (fig. 2). The tumor appeared to involve the right corpus cavernosum at one point. It was necessary to excise both the proximal portion of the left corpus cavernosum and a section of the right corpus cavernosum. A defect remained in the left corpus cavernosum. The postoperative course was uneventful, and the patient was discharged on the ninth postoperative day.

This patient's course has been followed yearly since the last operation. He has been completely symptom-free, with no evi-

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From the Department of Surgery (Dr. Cattell) and Fellow in Surgery (Dr. Mace), The Lahey Clinic.

[1] Thompson, H. T.: Involvement of the Penis by Carcinoma of the Rectum, Surgery 27:216-220 (Feb.) 1950.

dence of recurrence, for nine years after resection of his metastatic lesion. He has good urinary control; libido and potency are normal. For a few years following the operation during erection the penis would angulate to the left and to the site of the scar. In the past few years this has become almost completely corrected. The patient has no complaints and he carries on an extremely active life.

COMMENT

In the case reported it is difficult to determine whether involvement of the penis occurred by metastasis or by direct extension of the tumor. The fact that the examination failed to reveal any evidence of local recurrence of the tumor in the perineum other than that involving the penis would lead one to believe that it represented a metastatic lesion. Likewise, the fact that the patient has had no evidence of recurrence nine years following excision of the penile lesion is further indication that this was a metastatic lesion.

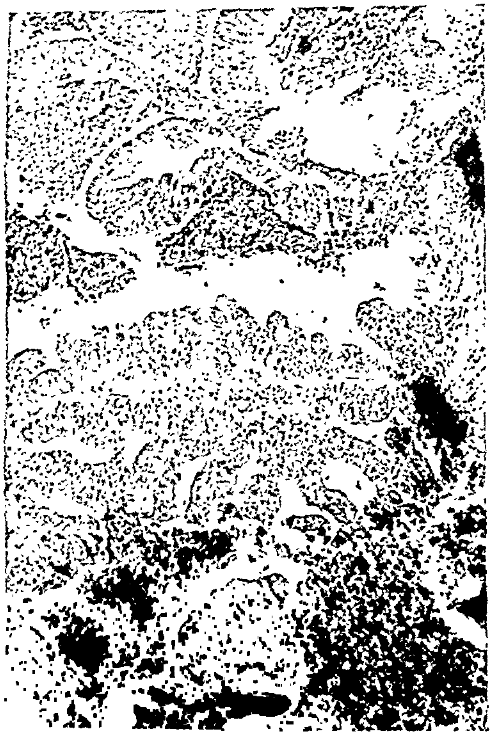

Fig. 2.—Section through the metastatic adenocarcinoma of the corpus cavernosum.

SUMMARY

A case of carcinoma of the rectum secondarily involving the penis is reported. This brings the total number of cases reported in the literature to five.

Priapism, which was the presenting symptom in two of the previously reported cases, was the presenting symptom of the penile lesion in this case.

In only one of the four cases previously reported had resection of the rectal tumor been performed before the appearance of the penile lesion. In this case an abdominoperineal resection had been performed two and one-half years previously.

Three of the patients in the four cases previously reported died within four months, and the other patient died 10 mo. following the appearance of the penile lesion. In this case the patient is alive and well nine years following excision of the penile growth and 11 years after abdominoperineal resection.

MUMPS VIRUS IN HUMAN MILK AND IN MILK OF INFECTED MONKEY

Lawrence Kilham, M.D., Bethesda, Md.

Detection of mumps virus in the milk of a mother with epidemic parotitis at the time of delivery is of clinical interest, as this virus, to my knowledge, has not been hitherto isolated from this source. Mastitis is rarely listed among the manifestations of mumps. As described below, mumps virus was also detected in the milk of a lactating monkey in whom infection had been artificially induced.

REPORT OF A CASE

E. M., a 23 year old Negro woman, was admitted to the hospital[1] on May 2, 1950, for parotitis of two days' duration. She had bilateral swelling and edema in the parotid areas. Mumps had developed in two of her children in the preceding three weeks. Shortly after arrival, the patient was delivered of a full term, normal infant. A sample of milk was obtained three days later at the onset of lactation, when the mother's breasts were engorged and painful. The infant was never breast fed. Its course during the first 3½ weeks of life was considered uneventful.

Laboratory Findings.—Serum specimens for antihemagglutination tests[2] were obtained from mother and infant at delivery and again 24 days later. The mother experienced an eight-fold rise of serum antibody titer from 1:80 to 1:640. No antibodies were detectable in the infant's serums. With the use of methods elsewhere described[3] mumps virus was isolated by inoculation of the mother's milk into the amniotic sac of 7 day old embryonated eggs. The virus appeared on first egg passage and was carried through four further passages. As a check, the virus was then reisolated from the original sample of milk. The agent was identified as mumps virus by antihemagglutination tests with known positive serums. In addition, this virus produced parotitis in a monkey, as described below. Portions of the placenta were ground and inoculated into embryonated eggs. No virus appeared in the course of three egg passages.

EXPERIMENTAL RESULTS

The strain of virus isolated from the patient E. M. and passed five times through eggs was used to induce mumps in two lactating rhesus monkeys (Macaca mulatta). Both monkeys had young of indeterminate age weighing about 2 pounds (907.18 gm.).

Monkey 1.—This monkey received 15 ml. of infected amniotic fluid intravenously. The baby monkey was then kept separate until the mother had been milked the following morning. The mother was milked in similar fashion every two or three days for the next three weeks. No mumps virus was isolated from milk taken in 18 hours and again in three days after inoculation. On the sixth day after inoculation virus appeared on the first egg passage of the milk, as it did from samples obtained on the 8th, 10th and 15th days. Thus the virus was detectable in the monkey's milk over a nine day period. It was not recovered from three subsequent specimens. The mother had no parotid swelling or temperature elevation during the experiment, and her breasts showed no swelling ascribable to mumps infection alone. She had a serum antibody titer of 1:640 by the antihemagglutination test 20 days after inoculation, having had no detectable mumps antibodies prior to this time. The baby monkey failed to show serum antibodies or to manifest any signs of illness.

From the Microbiological Institute, National Institutes of Health, Public Health Service.

[1] Footnote deleted.

[2] Robbins, F. C.; Kilham, L.; Levens, J. H., and Enders, J. F.: An Evaluation of the Test for Antihemagglutination in the Diagnosis of Infections by the Mumps Virus, J. Immunol. 61: 235-242, 1949.

[3] Kilham, L.: Isolation of Mumps Virus from the Blood of a Patient, Proc. Soc. Exper. Biol. & Med. 69: 99-100, 1948.

Monkey 2.—Bilateral parotid swelling developed in this monkey seven days after inoculation of Stenson's ducts with mumps virus, and antihemagglutinating antibodies appeared in the serum in a titer of 1:1,280 in the course of convalescence. Milk samples were obtained every two or three days, as in the preceding experiment. However, attempts at virus isolation in eggs were uniformly unsuccessful. As in the case of monkey 1, no detectable serum antibodies developed in the baby monkey, and it never appeared ill.

DISCUSSION

Isolation of mumps virus from the patient E. M. indicates that this agent may appear in human milk in the course of active disease. Presumably this is due to a concomitant mastitis. If such is the case, milk, like saliva, contains virus because it flows from an infected gland. Virus may also pass from the blood stream to the milk without local proliferation. The mumps virus, however, appears to have a predilection for glandular tissue, whether in salivary glands, pancreas or testicle. The fact that orchitis does not occur before the age of puberty suggests that only active testicular tissue is susceptible. By analogy lactating women may be more susceptible to mumps mastitis. The most pronounced signs and symptoms of mumps occur when glands with tough capsules, such as the parotids, and particularly the testicles, are affected. If an inflammatory swelling is not closely restricted, as might be the case in the pancreas or mammary glands for example, mumps infection would have a greater chance of being inapparent. The occurrence of inapparent infections in mumps has been well authenticated by others.[4] Thus mumps mastitis could be overlooked clinically. In the case of the first monkey, mumps virus did not appear in the milk in the hours following a sizeable inoculation of virus. This suggests that in this animal virus did not readily pass from the blood stream to the milk. On the other hand, the appearance of mumps virus in milk specimens taken six to 15 days after inoculation is suggestive of active proliferation in mammary tissue. In the second mother monkey, infection apparently failed to pass from the parotids to the milk.

It is of interest that the infant of patient E. M., in spite of having been in utero while its mother was in an active stage of disease, never gave clinical or serological evidence of mumps. Possibly, infants are not susceptible to mumps infection. To my knowledge, diagnoses of mumps substantiated by laboratory data have not been reported in infants. However, two other explanations are conceivable: first, the mumps virus may have failed to pass the placental barrier in the present instance, and, second, the infant may have been insufficiently developed to have produced a detectable antibody response. Both of the baby monkeys failed to contract mumps, in spite of close contact with infected mothers. It is possible that they also were relatively insusceptible.

SUMMARY

Mumps virus was isolated from the milk of a patient who developed parotitis two days before delivery. The virus was also recovered from milk from six to 15 days after intravenous inoculation of a lactating monkey. Neither the human infant nor the baby monkeys gave clinical or serological evidence of mumps infection.

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[4] Henle, G.; Henle, W.; Wendell, K. K., and Rosenberg, P.: Isolation of Mumps Virus from Human Beings with Induced Apparent or Inapparent Infections, J. Exper. Med. 88: 223-232, 1948. Maris, E. P.; Enders, J. F.; Stokes, J., Jr., and Kane, L. W.: Immunity in Mumps: II. The Correlation of the Presence of Complement-Fixing Antibody and Resistance to Mumps in Human Beings, ibid. 84: 323-339, 1946.

DEVICE FOR MEASUREMENT OF DIFFERENCES IN HEIGHT OF OPPOSITE SIDES OF BODY

H. Wright Seiger, M.D., Santa Monica, Calif.

A difference in leg length is of importance in many orthopedic and postural examinations. It is measured more accurately in the weight bearing position when the patient is standing erect.

Sighting with one's eyes and hands across the iliac crests or the gluteal muscles provides rough estimates, but these usually are too approximate for accurate measurement. A tape measure, while readily available, is neither accurate nor satisfactory to use on patients in the erect position.

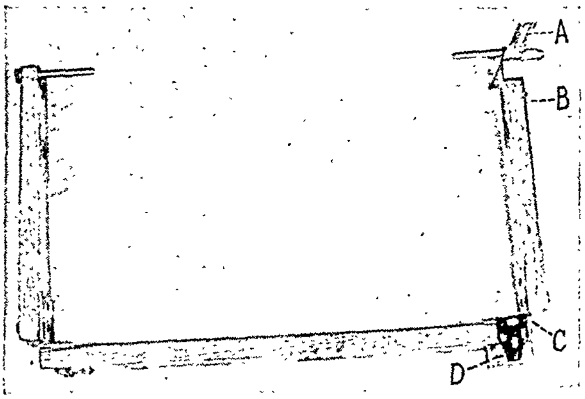

Fig. 1.—Photograph of device for measurement of differences in height of opposite sides of the body. *A*, 6 inch slotted steel rule marked in quarter-inches on inside and half-inches on outside of slot. *B*, set screw. *C*, hinge. *D*, photographer's level.

A rigid fluoroscopic screen[1] with a water level and a wire across the screen is accurate. However, this, besides the expensive apparatus, requires a darkroom and sufficient time for dilation of the pupils, unless a series of cases were being run consecutively.

A simple device that is equally accurate and can be made at a cost of a few dollars is described below. Measurement with this device requires only a few seconds. In addition, with this device, one has a record of the difference in height, which may be especially important in children. It can be used equally well for comparison of the height of the anterior superior iliac spines, greater trochanters, patellas, and shoulders. For the asymmetric, contracted, or arthritic pelvis, comparison of the anterior superior iliac spines is sometimes more accurate than measurement of the tops of the iliac crests, and this comparison also can be more easily done with this instrument. The photographs of the device are self descriptive (figs. 1 and 2).

---

[1] Judovich, B., and Bates, W.: Segmental Neuralgia in *Painful Syndromes*, Philadelphia, F. A. Davis Company, 1944, p. 43.

In practice the left pointer is placed over the left iliac crest, and the right pointer with the metal ruler attached is placed on the right iliac crest. A plus or minus reading is obtained directly. A reading accurate to one-eighth inch can be quickly obtained. The water levels should be checked momentarily beforehand. In an obese patient in whom the iliac crests are not felt distinctly, it might be preferable to mark the edge of the crests with a pencil in advance. The same applies to the anterior superior iliac spines or other parts of the body. If the device is dropped and the hinges are twisted out of shape, it can be quickly recalibrated by a recheck on the edge of a table that is level. The levelness of the table can first be ascertained by placement of the body of the device on the table.

For examiners with defective vision, the set screw at *B* can be tightened with the device on the patient, and a reading made in a strong light after removal of the device from the patient. In the same manner, one can steady the rule *A* with one's finger before withdrawing it to a stronger light. Finally, blocks of different thickness may be placed under the short leg until the difference is rectified. When the anterior superior iliac spines or the patellas are being measured, the patient should face the examiner.

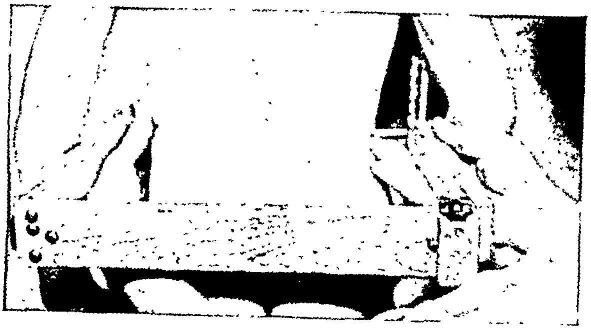

Fig. 2.—Photograph illustrating use of the device.

Made individually, the arms and body of the device can be more easily constructed of hardwood, but commercially, with proper dies, it probably should be made of light metal alloy.

CONCLUSION

The device described above is low in cost. It will give quickly and accurately, to one-eighth inch, a record of the comparative length, when the patient is standing erect, of both sides of the body at various levels and more particularly of the lower extremities.

520 Arizona Avenue.

Vitamin B_{12}.—At last, in 1948, after 20 years of endeavor, the nature of the antipernicious anemia principle was disclosed with the isolation of vitamin B_{12}. The pure vitamin, originally prepared from liver, has been shown to initiate and to maintain complete hematologic and clinical remission in nearly all cases of Addisonian pernicious anemia, quite as do highly purified extracts of liver. Because such effects can be produced by the daily injection of as little as one microgram of the pure vitamin, it is apparently one of the most active pharmacologic agents known. However, presumably because of the lack of the so-called gastric (intrinsic) factor, in most patients with pernicious anemia the daily oral administration of as much as 50 micrograms of vitamin B_{12} is relatively ineffectual.—W. B. Castle, M.D., Present Status of the Etiology of Pernicious Anemia, *Annals of Internal Medicine*, May, 1951.

A TRACTION DEVICE FOR FRACTURES OF THE FOREARM

Walter A. Wichern, M.D.
and
Robert H. Bacon, M.D., New York

Fracture of the lower radius and ulna of the Colles type is the predominant fracture encountered in the emergency service of any hospital. Many cases are complicated by pronounced comminution, displacement or both, so that traction becomes an important factor in reduction. Formerly, traction was applied by an assistant holding the brachium and another holding the hand. Such traction, in many instances, has proved inefficient. It is variable and necessarily of short duration, because the assistants become fatigued. Consequently, manipulation of the fractured elements becomes necessary, and increased trauma results. That efficient and adequate traction is the most important factor in the reduction of fractures has been appreciated for many years. This was particularly emphasized by Böhler.[1] It has been our purpose to provide mechanically a constant, fixed traction for the reduction of fractures of the forearm. This has been accomplished by a modification of an apparatus reported by Caldwell.[2] It has been used by the attending and resident staffs at the Roosevelt Hospital with consistently good results.

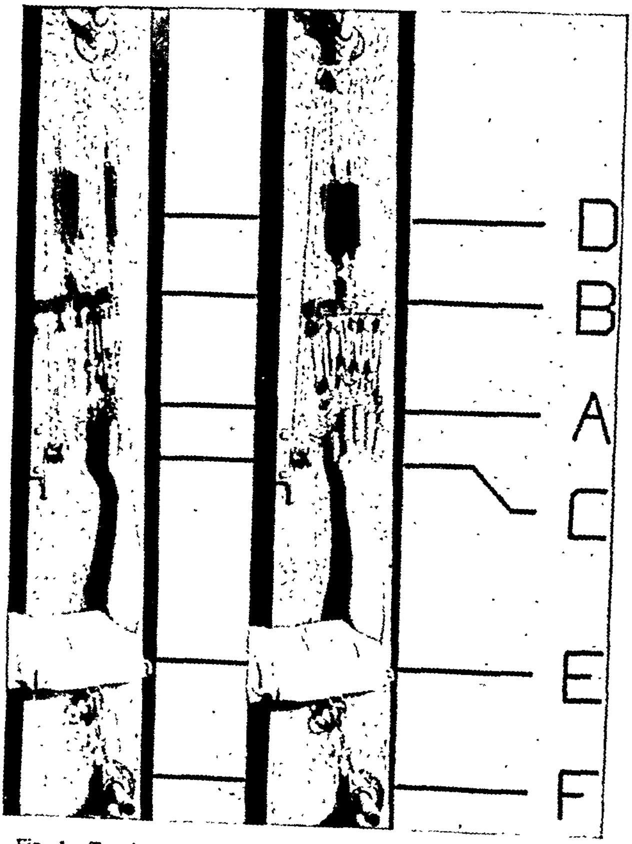

Fig. 1.—Traction Device. *A*, finger traps. *B*, T-bar and pulleys. *C*, winch. *D*, spring scale. *E*, padded canvas sling. *F*, upright pipe.

From Roosevelt Hospital.

[1] Böhler, L.: Treatment of Fractures, ed. 4, Baltimore, William Wood & Company, 1935.

[2] Caldwell, J. A.: Device for Making Traction on the Fingers, J. A. M. A. 96: 1226 (April 11) 1931.

The traction device is demonstrated in figures 1 and 2. The materials for its construction, which are rather easily obtainable, are as follows: plywood base of ¾ by 9 by 63 inches (1.91 by 22.86 by 160.02 cm.), five meshed wire finger traps,[3] a 0 to 50 pound spring scale, two lengths of 1 by 12 inch (2.54 by 30.48 cm.) pipe, two pipe mounts, wire cable, a canvas sling, 10 small pulleys and one large pulley and a winch with a rachet lock. It consists of a series of finger traps (fig. 1) that are fixed to a T-bar (*B*, fig. 1) by a system of pulleys designed to equalize the traction on the individual fingers. Traction is applied by means of a small winch (*C*, fig. 1) and wire cable that passes over a pulley attached to an upright pipe at one end of the plywood base. The amount of traction applied is recorded by a spring scale (*D*, fig. 1) between the T-bar and the wire cable. Countertraction is obtained by a well padded canvas sling (*E*, fig. 1) secured to an upright pipe (*F*, fig. 1) at the other end of the baseboard.

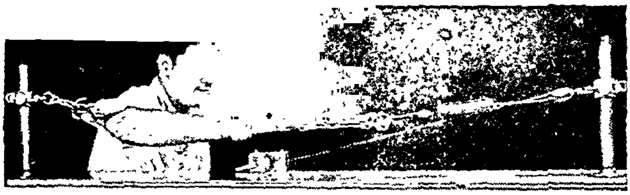

Fig. 2.—Side view of traction device, showing position of patient.

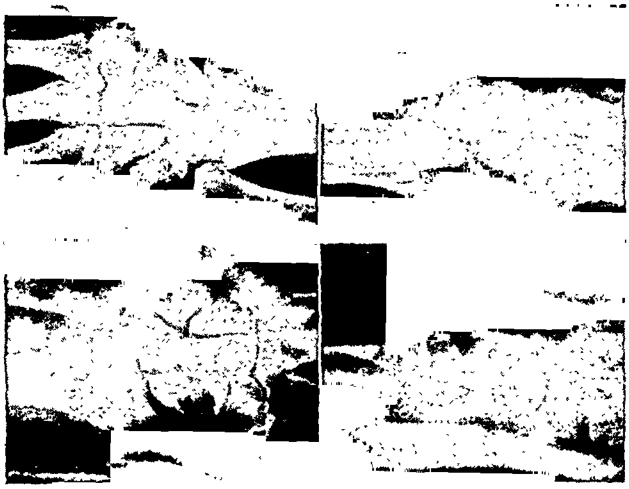

Fig. 3.—Colles' fracture. Upper left: anteroposterior view. Upper right: lateral view. Lower left: anteroposterior view after reduction. Lower right: lateral view after reduction.

The patient is positioned on the fluoroscopy table or sitting at its side (fig. 2). The skin of the hand and forearm is prepared with soap, alcohol-ether and benzalkonium (zephiran®) chloride solutions. Sterile drapes are applied. The hematoma at the fracture site is infiltrated with 10 cc. of 2 per cent procaine solution.[4] During the 10 minute period required for full anesthesia to be obtained, the skin of the fingers is protected with strips of adhesive tape and the finger traps are applied. The arm is placed in the apparatus, with the brachium abducted to 90 degrees and cradled in the canvas sling. The antibrachium is then flexed to 90 degrees, and traction is gradually applied by the winch. For Colles fractures, 18 pounds of traction applied for 10 to 12 minutes has given excellent results. During this period, the fractured elements are distracted and the circumferential force of the relaxed muscles causes them to seek a normal anatomical arrangement. No manipulation is necessary. With the arm still in traction, reduction is checked with fluoroscopy in the anterior-posterior and lateral views (fig. 1) and immobilization is carried out with plaster of paris splints. If desired, ulnar deviation and palmar flexion may be obtained by insertion of a firm roll of muslin, 6 inches (15.24 cm.) in diameter, under the volar aspect of the wrist. Traction is maintained until the plaster of paris splints are firm.

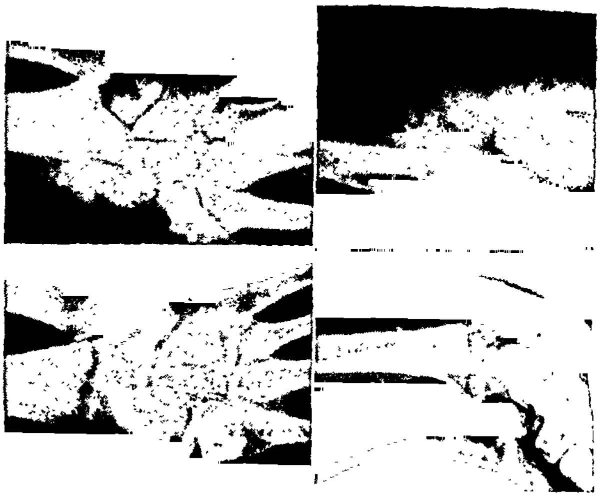

Fig. 4.—Colles' fracture with pronounced comminution and displacement of the distal radial fragment. X-ray views same as in figure 3.

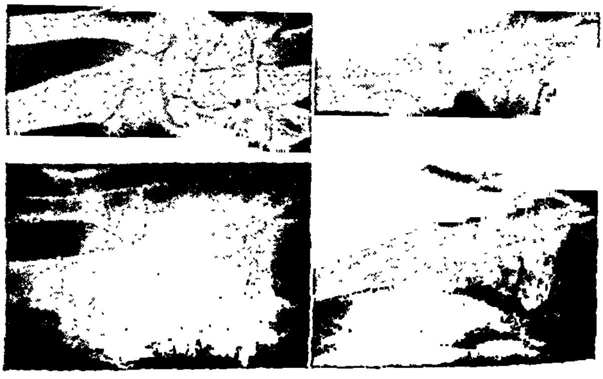

Fig. 5.—Colles' fracture with comminution and dorsal and lateral displacement of the distal radial fragment. X-ray views same as in figure 3.

Figures 3, 4 and 5 demonstrate results of traction applied for a period of 12 minutes. No manipulation was employed. Reduction was accomplished with ease and without additional personnel, who might be otherwise employed. All comminuted and displaced fractures of the radius and ulna are reduced with the traction apparatus. Seventy-five patients have been thus treated, and reduction and immobilization have been easily obtained.

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[3] The finger traps may be purchased from the Kellems Co., 15 Williams St., Stonington, Conn.

[4] We have found it possible in suitable subjects to reduce badly displaced Colles' fractures by the gradual application of traction without anesthesia. On the other hand, general anesthesia has been employed in apprehensive children.

There has been no difficulty with regard to compression of the fingers as a result of pressure from the finger traps. The device is also useful in the demonstration of the carpal bones, since by their distraction they become individually more prominent. It may also be used to distract metacarpal fractures with consequent reduction prior to their immobilization. Dislocations of the metacarpophalangeal and interphalangeal joints are readily treated. Distraction and reduction may be obtained and maintained for those fractures of the forearm requiring intraosseous fixation. The device is practical and efficient, and no contraindications are offered to its use.

SUMMARY

A traction device for the reduction of fractures of the forearm is described. This device is capable of applying efficient fixed traction, of known amount, which is adequate for the reduction of almost all Colles type fractures without further manipulation. The design and technique of its use and the results are described.

Roosevelt Hospital, 428 59th St. West, New York.

COUNCIL ON PHYSICAL MEDICINE AND REHABILITATION

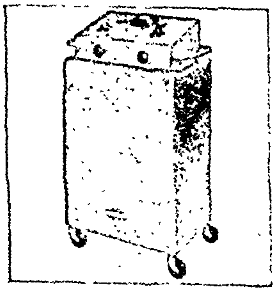
The Council on Physical Medicine and Rehabilitation has authorized publication of the following reports.

Howard A. Carter, *Secretary.*

ALOETRON SHORT WAVE DIATHERMY; MODEL F 8400, ACCEPTED

Manufacturer: A. S. Aloe Company, 1831 Olive St., St. Louis 3.

The Aloetron Short Wave Diathermy, Model F 8400, is a generator of short wave diathermy radiation of wavelength approximately 11 meters, frequency 27.12 megacycles. It is designed for both medical applications and office surgery. It can be moved about on the floor on casters, weighs 50 kg. (110 lb.), and measures 99 by 42 by 62 cm. (39 by 16½ by 24½ in.). Packed for shipment it makes a package weighing 110 kg. (240 lb.) and measuring 135 by 52 by 75 cm. (53 by 20½ by 29½ in.). The foreign shipping weight is 110 kg. Included in these shipping weights are one line cord and two 8 by 10 in. (20 by 25 cm.) pads.



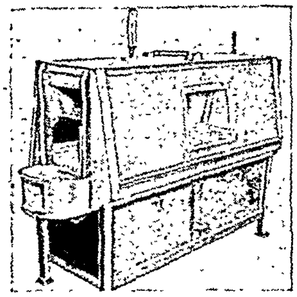
Aloetron Short Wave Diathermy Model F 8400

The Council obtained evidence of satisfactory construction; the performance of the induction cable, induction drum, triple induction drum (three-hinged panels) and cuff electrodes was found satisfactory. It was noted that the device was also furnished with pad electrodes, prostatic and vaginal electrodes, sinus electrodes and a "caput applicator," types of accessories which are not accepted by the Council. Evidence indicated that in phantom load tests the apparatus delivered 200 watts of output with adjustable drums and 155 watts with the cuff electrodes. A statement from Underwriters' Laboratories, Inc., certified that the apparatus had been found acceptable for listing, and a statement from the Federal Communications Commission certified that the apparatus has Type Approval No. D-525. The Council on Physical Medicine and Rehabilitation voted to include the Aloetron Short Wave Diathermy, Model F 8400, in its list of accepted devices with the reservation that pad electrodes, prostatic electrodes, vaginal electrodes, and sinus mask electrodes remain unacceptable because of insufficient evidence to substantiate the therapeutic efficacy of these accessories.

COMMONWEALTH THERAPEUTIC UNITS ACCEPTED

Manufacturer: Commonwealth Sheet Metal Engineering Work, 36 Wall St., Binghamton, N. Y.

The Commonwealth Therapeutic Unit, Model No. 1, is intended for the administration of fever therapy and for the application of heat to large areas of the body. It is a horizontal cabinet large enough to contain a recumbent adult with his head projecting through an aperture at one end. Designed primarily to permit the exposure of the trunk and extremities to warmed, humidified air as in fever therapy, it contains a sprinkler for washing the patient and for flushing the interior of the cabinet. The apparatus measures 241 cm. (95 in.) in length, 127 cm. (50 in.) in height and 86 cm. (34 in.) in width. It weighs about 258 kg. (570 lb.). When crated for shipment it measures 253 cm. (100 in.) in length, 138 cm. (54 in.) in height and 100 cm. (40 in.) in width. The weights are 373 kg. (820 lb.) for domestic and 408 kg. (900 lb.) for foreign shipment. Connections for hot and cold water are required for the waste pipe and for electricity. A window in the front enables the operator to observe the color of the patient's skin, and a porthole makes nursing care possible during prolonged fever treatments. The unit is not recommended for the treatment of obesity. There are two other models, Nos. 2 and 3, which differ only in size.



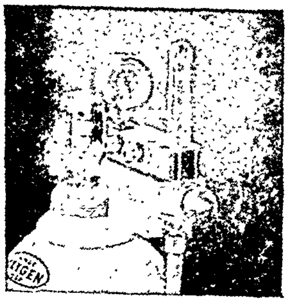
Commonwealth Therapeutic Unit

The Council obtained evidence from acceptable sources that the apparatus was of sturdy construction and that it performed as represented by the manufacturer. The Council on Physical Medicine and Rehabilitation voted to include the Commonwealth Therapeutic Units in its list of accepted devices.

LINDE TYPE R-501 OXYGEN THERAPY REGULATOR ACCEPTED

Manufacturer: Linde Air Products Company, A Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17.

The Linde Type R-501 Oxygen Therapy Regulator is a device intended for use in the clinical administration of oxygen in the hospital, the clinic, the physician's office, or the patient's home. It bears a gauge to indicate the pressure of the gas remaining in the cylinder and a flowmeter graduated in liters (of oxygen) per minute.



Linde Type R-501 Oxygen Therapy Regulator

The device is small enough to be fastened to and supported by a standing gas-cylinder of the usual 4 or 5 ft. size. It weighs 2.7 kg. (6 lb.). Packed for shipment it makes a package measuring 15 by 30 by 26 cm. (6 by 12 by 10 3/16 in.) and weighing 3.6 kg. (7 lb. 13 oz.). The foreign shipping weight is 3.6 kg.

Evidence was obtained from sources acceptable to the Council that the device was satisfactory for administering oxygen therapy under working conditions in a hospital ward. The Council on Physical Medicine and Rehabilitation voted to include the Linde Type R-501 Oxygen Therapy Regulator in its list of accepted devices.

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GRANTS TO MEDICAL SCHOOLS

Those interested in the future of medical education received substantial encouragement on July 19 with the announcement that the National Fund for Medical Education had made its initial distribution of grants totaling $1,132,500 to the 79 medical schools of the country. It is expected that the Fund, with the cooperation of professional, industrial, and civic leaders throughout America, will raise a total of at least 5 million dollars for medical education and that the schools will receive additional grants before the year is over.

The circumstances motivating this effort on the part of medical educators, the medical profession, and many from beyond the field of medicine to raise funds for the medical schools were and are many. The nation's facilities for the education of physicians have been heavily burdened during recent years by the effects of rising costs, reduced income from endowments, and fewer large individual gifts. As each year passed, the problem became more serious. Finally, it captured the attention of national leaders from many walks of life.

Representatives of the medical profession, in company with leaders from America's great industries, education, agriculture, and labor, who were aware of the urgency of needs at the inflation-plagued centers of medical education, met to devise a method of relief. Together, more than two years ago, they formed the National Fund for Medical Education, whose primary responsibility is to raise needed funds from voluntary sources and distribute them to the nation's medical schools. The initial grants signal the first achievement of these goals.

In comparison with the over-all operating budgets of the medical schools, totaling many millions, the National Fund's grants may seem to some small. Four-year schools received $15,000, while two-year schools were given half that amount. However, for many of the schools these grants constitute the largest amount of totally unrestricted money that they have had available in recent years. Consequently, these grants, which each school can use where they are most needed, have for the medical schools a useful value out of proportion to the actual number of dollars involved.

The medical profession is demonstrating its willingness and ability to aid significantly in meeting the problem of the nation's medical schools. Through the American Medical Education Foundation, one of the supporters of the National Fund, the physicians of America have provided more than one-half the total fund just distributed. The profession's activities in support of the Foundation, however, must continue, for it has pledged itself to raise a minimum of a million dollars during 1951.

The goal for 1951 is still unmet, and in a spirit of "first things first," every physician in America is asked to do his part in preserving and strengthening the educational institutions which have made the standards of his profession possible. He can help by giving immediately a contribution to the American Medical Education Foundation. Information on such contributions can be found on Advertising page 15 of this issue of THE JOURNAL.

ASPIRATION OF VOMITUS DURING OBSTETRIC ANESTHESIA

In a recent article Merrill and Hingson [1] call attention to the hazard of aspiration of vomitus during anesthesia in obstetrics. Questionnaires replied to by 183 hospitals reporting a total of 2,503,921 births in the past five years revealed 59 maternal deaths during this period from such aspiration during induction or during emergence from anesthesia. From these figures, the authors estimate that in the United States there must be at least 100 maternal deaths per year from this cause. This would represent some 2% of the total maternal mortality.

Factors that predispose to vomiting during obstetrical anesthesia include a delay in the emptying time of the stomach during labor; a predisposition to anoxia due to limitations of respiratory exchange caused by the enlarged uterus; the light anesthesia that is necessary to maintain uterine contractibility and the cooperation of the patient, but which renders the vomiting center hypersensitive; and the difficulty of achieving proper preparation in the face of certain obstetric emergencies. To reduce the incidence of these seemingly unnecessary deaths, the authors recommend that prenatal instruction include a warning of the danger of eating at home after the onset of labor. In the hospital, food by mouth should be withheld from all patients in active labor. For those patients in rapidly advancing labor who have eaten within six hours, spinal or caudal analgesia should substitute for intravenous or inhalation anesthesia unless the stomach is artificially emptied. Finally, adequate equipment should be readily available in the delivery room for the treatment of vomiting during anesthesia. Recommended therapeutic measures include placing the patient in deep Trendelenburg position, stopping anesthesia to permit return of the cough and laryngeal reflexes, aspiration of food particles under direct bronchoscopic examination, and the administration of 5 to 10% carbon dioxide to produce hyperpnea.

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[1] Merrill, R. B., and Hingson, R. A.: Study of Incidence of Maternal Mortality from Aspiration of Vomitus During Anesthesia Occurring in Major Obstetric Hospitals in United States, Anesth. & Analg. 30: 121 (May-June) 1951.

INCOME OF PHYSICIANS

The United States Department of Commerce published in its July *Survey of Current Business* an article by William Weinfeld, "Income of Physicians, 1929-49." This is the first report of the results of the survey of the 1949 incomes of physicians in the United States which was a joint undertaking of its Office of Business Economics and the American Medical Association's Bureau of Medical Economic Research. Elsewhere in this issue (page 1249) is a summary and analysis of this first report by Frank G. Dickinson, Director, and Charles E. Bradley, Associate in Economics, Bureau of Medical Economic Research. They have worked closely with Mr. Weinfeld and Mr. M. Joseph Meehan, Director of the Office of Business Economics, in preparing the questionnaires, in selecting the samples, and in the mailing. The tabulations and the interpretations in the Weinfeld article, although presented to Dickinson and Bradley for critical examination prior to publication, are the responsibility of the Department of Commerce. Later the questionnaires will be loaned to the Bureau of Medical Economic Research for further analysis and study.

This survey, in which more than 55,000 physicians participated, is the broadest mail questionnaire survey of professional incomes ever made in the United States. The wide variety of data provided makes it difficult to prepare a short summary. The more important averages are presented in the summary by Dickinson and Bradley. Possibly the most significant general conclusion is found in the third paragraph of Weinfeld's article: "In the 20 year period since 1929, the average net income of all civilian physicians more than doubled, but this relative increase was practically identical with that for all earners in the general population over the same period." Dickinson and Bradley reached the same conclusion regarding changes since the period 1935-1939, a more commonly used base period than 1929 in economic reports. They also call attention to the fact that all averages refer to net income before taxes, and that the gain in net income after taxes in recent years was considerably less. The increases in the earnings of physicians during the past 12 or 20 years have been due to three factors: a moderate increase in fee schedules, better collections, and greater "output per physician."

The average (mean) net income from medical practice of the 30,000 physicians whose returned questionnaires have already been analyzed was $11,058; this net amount was 60.4% of the average (mean) gross income, $18,316. Since 1945 the percentage of the mean net to the mean gross income of nonsalaried physicians declined from 63.3% to 59.6%. The median net income was $8,835; that is, one-half of the physicians reported net incomes of less than this amount and the other one-half reported higher incomes. Many statisticians regard the median income as more descriptive than the mean income in such surveys.

The reactions of physicians to these and the other averages from the survey will vary considerably. Older physicians who have been in practice for many years may consider them too high, while physicians at the earning peak of their lives may regard them as too low. The very large numbers of returns analyzed, 30,000, would seem, however, definitely to establish these averages for the broad groups of physicians.

Weinfeld notes that the evidence is now clear that the average earnings of physicians are above those of lawyers, the reverse of the situation which prevailed one or two decades ago. He also notes that the physicians who are compensated entirely by salary had mean incomes $3,310 lower than those who received no salary, that is, dependent entirely on fees from patients. Dickinson and Bradley attribute roughly one-fourth of this difference to the pension rights of salaried physicians and as much as one-fourth to the value of vacation pay and sick leave benefits.

The mean net income reported by general practitioners in independent practice was $8,835 as compared with $15,014 for full-time specialists. Weinfeld calls attention to the fact that this excess was not as great, percentagewise, in 1949 as it was in 1929—$6,200 and $6,100.

The mean and median net incomes of the nonsalaried physicians were highest in the Far West (Washington, Oregon, Nevada, and California), $14,235 and $12,243. New England ranked lowest in both mean and median incomes, $9,602 and $7,818. The Weinfeld article also presents averages for individual states and named cities. Dickinson and Bradley, however, have some doubts about the statistical validity of some of these averages for particular cities and states and are also somewhat skeptical about the averages for the specialties which ranked neurological surgeons first and pathologists second in both mean and median incomes.

This survey provides good bench-mark data on the incomes of physicians, a subject about which there has been a considerable amount of highly speculative writing and speaking in recent years. Thus the entire medical profession has benefited by the willingness of 55,000 of its members to cooperate with the U. S. Department of Commerce in one of the periodic surveys needed in the preparation of estimates of national income and personal consumer expenditures. The study is replete with evidence that the highest average incomes are not being earned by physicians in the large metropolitan cities. This information should buttress the arguments of the many physicians and lay leaders interested in improving medical care in the smaller cities and towns of the rural parts of the country. Although many factors are involved in the choice of location, this study is commended to all interns and residents who are faced with the problem of choosing a location.

In the larger sense this study demonstrates again that there was no nation-wide shortage of physicians in 1949, for physicians' incomes had risen just about as fast percentagewise as the average income of the American people. The mean and median net incomes in 1949 of physicians would have been far higher if there had been a nation-wide shortage of physicians. On the other hand, this study provides much evidence of the economic advantages of practicing medicine in the small and medium-sized cities and, indirectly, may suggest to some an over-supply of physicians in metropolitan centers.

THE PRESIDENT'S PAGE

A MONTHLY MESSAGE

One of the primary reasons for the organization of the American Medical Association in 1847 was "to elevate the standard of medical education in the United States." Ever since that first meeting, the advancement of medical education has been a continuing major activity of our Association. It is fitting, therefore, that I devote one of the President's Pages to a review of the A. M. A.'s influential role in this field and to a discussion of the profession's responsibility in the training of future physicians.

One of the first acts of the American Medical Association after its organization was the establishment of a Committee on Education. This committee faced a chaotic situation. The westward migration and other unsettled conditions in the United States made the demand for doctors high. Since there were virtually no restrictions on the establishment of medical schools, they were mushrooming rapidly. Most of them were operated for the profit of promoters and faculty, and more attention was given to attracting numbers of students than to the quality of training. While there were a few good schools, most of the remainder ranged from six-month semblances of scientific educational institutions to diploma mills which sold degrees for a fee.

The struggle of the American Medical Association, together with the Association of American Medical Colleges and other groups, to raise the standards of education from this chaos to their present high level provides one of the most brilliant chapters in modern medical history.

During the first 56 years of the Association's existence, many resolutions were passed and the schools were asked again and again to improve their curriculums, with little result. Then, in 1903, the Committee on Education was reorganized as the Council on Medical Education. This strengthened group established "minimum" and "ideal" standards for medical schools, thus giving them specific goals. It also divided the schools into four classes, on the basis of the number of their graduates failing to pass state licensure examinations, and regularly published these tables.

Considerable resentment developed in the medical colleges from these reports. To help offset this, the Council asked the Carnegie Foundation to conduct a study of medical education, the result of which was the famous Abraham Flexner report which illustrated so clearly the deplorable state of the medical schools in the United States. From that time on, the revolution was under way and the poor schools either closed or else improved their curriculums until they received approval. Today all schools in the United States are fully approved by the Council. Its work with medical education, therefore, is now less of a policing action and much more of a counseling and information service.

Meanwhile, the Council on Medical Education had recognized the importance of internships, and in 1912 it undertook its first survey of hospitals. Since 1928 the Council has maintained a staff of trained hospital inspectors who devote full time to improving education standards in hospitals. They not only collect factual data necessary for evaluation but counsel hospitals on ways and means of improving training. This well-recognized consultation service operates without cost to hospitals in the United States.

Another field that attracted the attention of the Council during the second two decades of this century was that of graduate education. Realizing that physicians must continue learning after receiving their degrees, and recognizing the importance of further study in special fields, the Council in 1920 organized 15 committees "to recommend what preparation was deemed essential to secure expertness in each of the specialties." These committees were the forerunners of today's specialty boards, which have developed and now operate with the assistance of the Council.

Other important activities which can be mentioned only in passing are the approval of schools for laboratory technicians, occupational therapists, and other technicians in fields allied to medicine (at their request), the listing of postgraduate medical courses, openings for residencies and internships, and foreign medical schools, and periodic national surveys of medical education.

This brief history shows clearly the important role that the American Medical Association, through its Council on Medical Education and Hospitals, has played in the improvement of medical education. This role has brought it on occasion into conflict with groups both within and without the profession. However, the high regard in which medical education is held today attests to the soundness and integrity of its work.

While continuing the many constructive activities I have detailed above, the American Medical Association is again embroiled in a controversy, this time over federal aid to medical education. There is no doubt that our medical schools need more money. The Association believes, however, that S. 337, the federal aid to medical education bill now before Congress, would inevitably lead to federal control because it provides funds for over-all operating expenses of medical schools—thus putting a finger in every budgetary pie. The Commission on Financing Higher Education also opposed this bill in a recent report, saying that, until it had been demonstrated that other sources of funds were exhausted, no such radical and far-reaching change should be undertaken.

The American Medical Association proposes this two-point program instead: (1) stepped-up raising of voluntary funds through the American Medical Education Foundation and the National Fund for Medical Education, and (2) one-time federal grants, administered locally, for construction and renovation of the physical plant of medical schools. This latter would be similar to the Hill-Burton construction act for hospitals.

The American Medical Association's stand is a strong one if voluntary support is forthcoming. Other groups in society have indicated their willingness to help, but it is up to the medical profession to lead the way in raising funds. Since the time of Hippocrates, we physicians have accepted the obligation to transmit the art of medicine to future generations. We are further obligated by the fact that not one of us paid entirely for our own medical education. If we attended a state school, our training was paid for in part by the taxpayers. If we attended a private university, various philanthropic groups and individuals helped finance our education. The change in tax structure during the past two decades has made it increasingly difficult for individuals to amass great wealth and for states to raise additional funds. Medical education, therefore, must be supported by contributions from a broad base, and the medical profession must constitute its central core.

Full information on the American Medical Education Foundation may be found on advertising page 15. I earnestly ask that every doctor of medicine read this information, consider his obligation to his profession, and give generously to the Foundation. If each physician gives $100 a year, it will provide some 18 million dollars annually for medical education. These gifts would be a direct contribution not only to America's future health but also to the freedom of our profession.

John W. Cline, M.D., San Francisco.

MEDICAL NEWS

ARIZONA

Pathologists and Radiologists Organize.—At a recent meeting the Arizona Association of Pathologists and Radiologists voted to disband in order to allow the organization of separate groups for each specialty. The radiologists reorganized as the Arizona Radiological Society and elected Dr. Maurice R. Richter, Phoenix, president; Dr. Herbert D. Welsh, Tucson, vice president, and Dr. R. Lee Foster, Phoenix, secretary-treasurer. The pathologists organized the Arizona Society of Pathologists with the following officers: Dr. George O. Hartman, Tucson, president; Dr. Onie O. Williams, Phoenix, vice president, and Dr. Ralph H. Fuller, Tucson, secretary-treasurer.

GEORGIA

New Executive Secretary.—The Medical Association of Georgia announces the appointment of Mr. Sid Wrightsman Jr. as executive secretary and public relations director, effective July 15. It is requested that all correspondence be directed to him. The new address of the association is 875 West Peachtree St., N. E., Atlanta. The next annual session of the association will be held in Atlanta, May 11-14, 1952, at the Atlanta Biltmore Hotel.

ILLINOIS

Recommends Restriction of Hospital Visitors.—Restriction of maternity patients' visitors to one a day, preferably the father, has been recommended by the state department of public health in view of reports indicating increased incidence of diarrhea in the general population of the state. In addition to the control of visiting, hospital administrators in cooperation with doctors and nurses are asked to strengthen other control methods so that safe care of mothers and infants may be assured. Physicians are encouraged to report to their local health departments all diarrheal diseases irrespective of cause. There is no known epidemic in hospital nurseries at this time. The objective is to prevent one. The public can help by its understanding, cooperation, and support.

Chicago

Borden Undergraduate Award.—Dr. Robert E. Lee has been named recipient of the Borden Undergraduate Research Award for 1951 at the University of Illinois College of Medicine. The award, representing a gift of $500, for originality and thoroughness of research is presented by the Borden Company Foundation, Inc. Dr. Lee recently received the doctor of medicine degree from the university.

Gift from Solomon Foundation.—The Hektoen Institute for Medical Research of the Cook County Hospital has received a $50,000 check for medical research from the Dr. Jerome D. Solomon Memorial Research Foundation. The foundation is reported to have given a total of $350,000 for work carried on at the institute.

Fellowship Award Renewed.—Dr. Abe Oyamada, a resident in the department of pathology of Mount Sinai Hospital, has been awarded the Ruth Berger Reader Fellowship in the amount of $1,500 for research on hemolytic anemias. This is the second year that this fellowship, supported by the Hematology Foundation in Chicago, has been awarded to Dr. Oyamada, who will carry on his investigations under the supervision of Dr. Israel Davidsohn, professor of pathology at the Chicago Medical School and director of laboratories at Mount Sinai Hospital.

Doctor Grubbe Honored.—Dr. Emil H. Grubbe was guest of honor at a meeting July 11 of the Alumni Association of Hahnemann Medical College, which is no longer in existence. Dr. Grubbe was presented a scroll of honor for his meritorious service in pioneering in radiation therapy. He is credited with being the first scientist ever to use x-rays for healing. Dr. Grubbe was graduated from the college in 1898. His pioneering research cost him his left hand, parts of his upper lip and jaw, and the use of his right hand. Dr. Grubbe retired from active practice two years ago but still sees a few patients in his home.

MAINE

State Secretary Retires.—The council of the Maine Medical Association at its meeting in June released the following statement:

> Dr. Frederick R. Carter of South Portland, who has served as secretary-treasurer of the Maine Medical Association since 1937 has retired from those offices, as well as his positions on the *Journal of the Maine Medical Association*. Dr. Carter . . . has retired for reasons of health. Mrs. Esther M. Kennard, who has served as Dr. Carter's assistant for several years, was elected as acting secretary-treasurer until the council has the opportunity to study carefully such reorganization of these duties as Dr. Carter's retirement makes necessary.

MARYLAND

Personal.—Dr. Alfred Blalock, professor of surgery at Johns Hopkins Medical School, Baltimore, received an honorary doctor of science degree at the University of Rochester, New York, June 12.

New Organization of State Health Department.—Reorganization of the state department of health in accordance with the new health law enacted by the General Assembly of Maryland earlier this year became effective July 1. The recently adopted plan establishes seven bureaus. Only the chiefs of the bureaus and members of the executive office are now directly responsible to the director of health. Chiefs of divisions are accountable to the director through the chiefs of the bureaus to which their programs have been assigned. The changes were recommended on the basis of a survey undertaken in 1949. The seven bureaus are as follows: Office of the Deputy Director, Bureau of Laboratories, Bureau of Preventive Medicine, Bureau of Tuberculosis, Bureau of Medical Services and Hospitals, Bureau of Environmental Hygiene, and Bureau of Management. The executive office consists of a legal adviser, a consultant in public health administration, a public relations assistant, and an administrative assistant.

MASSACHUSETTS

Clearinghouse for Postgraduate Education.—A central clearinghouse of all available information concerning postgraduate medical education in this state is now being set up as a service to physicians by the Massachusetts Medical Society. Instead of having to "shop around" to find a desired program, following completion of a survey now in progress, a physician will need but contact the clearinghouse to be set up in the society's headquarters at 22 The Fenway, Boston. Mrs. Charlotte W. Troutwine of Newton Center is executive secretary. The clearinghouse is sponsored by the society's Committee on Postgraduate Medical Education, in cooperation with the medical schools of Harvard, Boston University, and Tufts; the Lahey Clinic; Massachusetts Heart Association; the Joslin Clinic; Massachusetts Tuberculosis and Health League; National Foundation for Infantile Paralysis, Inc., and the Massachusetts Academy of General Practice.

MINNESOTA

Dr. Lillehei Wins Smith Award.—Dr. C. Walton Lillehei, now associate professor of surgery at the University of Minnesota Medical School, Minneapolis, was recently awarded the Theobald Smith Award in Medical Sciences for 1951. The award, $1,000 and a bronze medal, established by Eli Lilly & Company, Indianapolis, in 1936, was made at a dinner of the Cleve-

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Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

land meeting of the Federation of American Societies for Experimental Biology. Much of Dr. Lillehei's research has been concerned with endocarditis, glomerulonephritis, and related ailments.

Personals.—The University of Minnesota awarded certificates of merit June 18 to the following veteran members of the Mayo Foundation staff in Rochester: Drs. Donald C. Balfour, Dorr F. Hallenbeck, Melvin S. Henderson, Monte C. Piper, and Harry G. Wood. The certificates were given as "a token of the appreciation which the University feels for their splendid years of service." ——Edward J. Baldes, Ph.D., of the Mayo Foundation, Rochester, has been named "Chevalier de l'Ordre National de la Legion d'Honneur" by the French government, "as a token of gratitude for outstanding services . . . rendered to medical sciences, especially . . . in the field of aeronautics. . . ." The award was presented by M. Francois Briere, consul general of France at Chicago, in Balfour Hall, Mayo Foundation House, July 10.

MISSOURI

County Society Presents Gold Keys.—The Jackson County Medical Society at its installment of officers on June 29 presented gold keys to Dr. Herbert L. Mantz and to Eric Williamson, both of Kansas City. Dr. Mantz has been director of the tuberculosis clinic at the city's General Hospital for 24 years, was president of the Missouri Tuberculosis Association from 1945 to 1948 and of the National Tuberculosis Association in 1949, and now is national consultant in the tuberculosis program of the Veterans Administration. Eric Williamson, an insurance man for 21 years, was cited for his leadership in the Kansas City chapter of the Arthritis and Rheumatism Foundation. He served as the first president of the local chapter of the Arthritis and Rheumatism Foundation and has led its local campaigns and participated in its national program. At the recent convention of the American Rheumatism Association in Atlantic City he was a guest speaker.

NEW MEXICO

State Medical Election.—At the recent annual meeting of the New Mexico Medical Society in Santa Fe, Dr. Leland S. Evans, Las Cruces, was installed as president. Elected officers include Dr. Coy S. Stone, Hobbs, president-elect; Dr. Albert S. Lathrop, Santa Fe, vice president, and Dr. Lucien G. Rice Jr., Albuquerque, secretary-treasurer.

Personal.—Dr. Stuart W. Adler, Albuquerque, has been named "top man of the year" by the local junior chamber of commerce. He has long been active within the medical profession of Bernalillo County and the state and has been a leader in the mass x-ray projects of the tuberculosis association, the health center of the New Mexico Society for Crippled Children, the New Mexico Health Foundation, and the Cerebral Palsy School.

NEW YORK

Award for Discovery of the Coxsackie Virus.—Dr. Gilbert J. Dalldorf, director of the state department of health's Division of Laboratories and Research, has received the Harold J. Fisher Memorial Award for discovery of a virus which produces a disease similar to poliomyelitis. Unlike the virus of poliomyelitis, which attacks the nerves, the virus isolated by Dr. Dalldorf attacks the skeletal muscles, the nervous system being unaffected. He has named the new virus "Coxsackie" because the patients from whom it was first isolated were residents of that village (THE JOURNAL, Feb. 17, p. 488).

New York City

Academy Clarifies Statement on Immunization.—The New York Academy of Medicine through the Committee on Public Health Relations, and with the concurrence of City Commissioner of Health Dr. John F. Mahoney, clarifies the latter's recent advice to physicians in regard to the avoidance of elective injections during the summer months of 1951 (THE JOURNAL, June 30, p. 856).

1. Immunization against smallpox, typhoid fever, and other communicable diseases should be given to all persons who are about to leave the country, as required by law or the regulations of the immigration authorities.

2. Immunization against smallpox, typhoid fever, rabies, diphtheria, and other communicable diseases should be given during an epidemic or local endemic of these diseases to all susceptible persons who may be exposed to the infection.

3. Immunization against smallpox and typhoid fever should be given to children who are to travel or vacation in areas where they may be exposed to such infection.

4. Desensitization against hay fever, asthma, and other allergic conditions is warranted.

5. Insulin therapy should be continued in diabetic children and adults.

6. Penicillin and other antibiotics as well as other life-saving injections should be administered during summer months whenever indicated clinically.

7. Primary immunization of the population against diphtheria, tetanus, and whooping cough should be concentrated in the first six months of life. Repetition of such immunization at a later age should be carried out November 1 to April 30 during the year 1951-52, but this general rule should not prevent a physician from giving such immunizations during the summer months to persons exposed to infection if in his judgment there is danger of acquiring such infection.

OREGON

Dr. Hill to Head Pediatric Department.—Dr. Allan J. Hill Jr., clinical assistant professor of pediatrics at the University of Minnesota Medical School, Minneapolis, has been appointed head of the department of pediatrics at the University of Oregon Medical School, Portland, and chief of the Doernbecher Memorial Hospital for Children.

SOUTH CAROLINA

State Medical Election.—Among the officers of the South Carolina Medical Association chosen at its recent annual meeting are Dr. Joseph D. Guess, Greenville, who was installed as president, and Dr. Lawrence P. Thackston, Orangeburg, president-elect. The secretary is Dr. Nathaniel B. Heyward, Columbia, and the treasurer Dr. J. Howard Stokes, Florence.

WEST VIRGINIA

School Health Conference.—The third Annual Working Conference on School Health will be held at Jackson's Mill during the week of August 20. The conference is sponsored by the state departments of health and of education and West Virginia University. The program will be broken down into general school health instruction, nutrition instruction, and safety instruction. The conference will be strictly a working conference in which those who attend will have an opportunity to participate and present their problems for group assistance. Expert consultants on school health will be present in an advisory capacity.

GENERAL

Conference on Alcoholism.—The National States' Conference on Alcoholism will hold its annual meeting at the Hotel Taft in New Haven, Conn., August 5-8. The program includes reports on state activities and developments in related agencies, including the World Health Organization, National Committee on Alcoholism, American Psychiatric Association, U. S. Public Health Service, and the Committee on Chronic Illness of the American Medical Association. There will be reports on research developments and discussions of problems of therapy. Details may be obtained from the program chairman, Walter O. Cromwell, 310 North Orchard St., Madison 2, Wis.

French Stamp Honors Medical Military Medicine.—A 15-franc stamp issued by France on June 18 honors military medicine. It pictures the Val-de-Grace Chapel, a religious edifice which in 1793 was transformed into a military instruction hospital, and in 1850 into a school of military health service. It also carries the portraits of three medical scientists identified with the service: Robert Picque (1877-1927), a surgeon who pioneered in performing operations at the front in World War I; Zacharie Roussin (1827-1894), pharmacist and toxicologist, and Antoine Villemin (1827-1892), a physician who did tuberculosis research.

WHO Regional Office in Manila.—The World Health Organization Regional Office for the Western Pacific was formally established May 21, as the regional committee held its first session in Geneva with the participation of 12 countries and of states having trust territories in that region. The committee recommended the selection of Manila as the permanent headquarters for the regional office. It also nominated Dr. I. C. Fang, present director of the temporary regional office in Hong Kong, as permanent regional director. Both decisions were confirmed by the WHO executive board in Geneva in June. The first session of the regional committee, which elected Dr. R. G. Padua, vice health minister of the Philippines, as chairman, was attended by representatives of Australia, New Zealand, Viet Nam, Cambodia, Philippines, Laos, Korea, Japan, France, United Kingdom, Netherlands, and Portugal. The representative from Australia was present as an observer.

Action on Shortage of Insecticides.—As one of a series of steps designed to relieve a world shortage of chlorine-based insecticides, including DDT, the World Health Organization has asked the United Nations to set up a special body to investigate the problem. A communication from Dr. Brock Chisholm, WHO director-general, will be placed before the 13th session of the Economic and Social Council opening on July 30 in Geneva. WHO points out that the availability of insecticides has been sharply affected by the shortage of essential raw materials (chlorine, benzene, and sulphuric acid) resulting from defense programs of the major producing countries. A survey of public health requirements of insecticides for all member states showed that a total of 23,688,000 pounds of DDT will be needed for the last half of 1951 and the full year of 1952.

Personals.—Dr. Donald D. Van Slyke of the Brookhaven National Laboratory, Upton, N. Y., has become a counselor of the Lilly Research Grants sponsored by Eli Lilly & Company, Indianapolis. Since 1948 he has been assistant director and physiologist at the Brookhaven National Laboratory, assisting in the organization of the departments of biology and medicine, and during the past two years he has also served as chemist in the department of medicine. Although now relinquishing his administrative responsibilities as assistant director at the Brookhaven Laboratory, Dr. Van Slyke will continue his research work there in the department of medicine.——At the annual session of the American College of Physicians Dr. Rolla E. Dyer, director of research, Emory University, was awarded the James D. Bruce Memorial Medal for 1951 in the field of preventive medicine.

Fund for Fundamental Research.—Sharp & Dohme, Inc., Glenholden, Pa., has authorized $50,000 to be placed in a special fund for grants to outstanding university scientists for the advancement of fundamental research in the fields of biology, microbiology, and chemistry. At the same time two grants of $10,000 each were made from this new fund to Wilbur W. Swingle, Ph.D., department of biology, Princeton University, Princeton, N. J., and to Dr. Stanley J. Sarnoff, School of Public Health, Harvard University, Boston. The grants are to be awarded on a year-to-year basis, but grants may be renewed for at least two additional years. There will be complete freedom of communication and publication of the results of the research supported by the grants. Dr. Swingle will conduct basic investigations on the adrenal cortex and resistance to toxic agents. Dr. Sarnoff will direct basic research in the cardiovascular field with special emphasis on the causes and prevention of lung edema.

Home Care Plans for Poliomyelitis.—A March of Dimes grant of $18,262 will enable the American Physical Therapy Association to include a continuing study of home care plans for polio and other patients in its educational program. Since 1946 a broad educational program has been undertaken by the association with the assistance of the National Foundation for Infantile Paralysis to recruit more students for physical therapy training, to make more effective the professional training, to provide visual aids and instructional material to meet the needs of graduate physical therapists in providing better care for poliomyelitis patients, and to improve personnel practices in the field. The grant will enable the association to continue its extensive study of the various physical therapy home care plans now in operation throughout the country. Association officials point out that it is becoming impossible to care for large numbers of polio patients in institutions for long periods of time because of the lack of hospital beds, insufficient professional personnel, and the high cost of institution care. Completion of the study on home care plans will enable the association to provide guidance to the agencies providing physical therapists for home care as well as advising the physical therapists thus employed. Efforts will also be made to have physical therapy home care plans included in school curricula and to stimulate physical therapists to accept field service employment.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States in the weeks ending as indicated:

Division and State	July 14, 1951	July 7, 1951
New England States	20	11
Maine	1	..
New Hampshire	..	..
Vermont	..	1
[illegible]	17	5
[illegible]	..	..
[illegible]	2	5
Middle Atlantic States	44	29
New York	26	17
New Jersey	7	5
Pennsylvania	11	7
East North Central States	111	69
Ohio	24	7
Indiana	8	3
Illinois	40	16
Michigan	24	21
Wisconsin	15	12
West North Central States	53	24
Minnesota	7	4
Iowa	12	..
Missouri	13	6
North Dakota	4	1
South Dakota	2	1
Nebraska	7	7
Kansas	8	5
South Atlantic States	73	41
[illegible]	..	1
[illegible]	6	1
[illegible]	..	3
Virginia	4	2
West Virginia	3	1
North Carolina	7	6
South Carolina	3	3
Georgia	32	14
Florida	18	10
East South Central States	60	43
Kentucky	1	..
[illegible]	16	4
[illegible]	27	22
[illegible]	16	17
West South Central States	155	124
Arkansas	12	15
Louisiana	29	30
Oklahoma	22	21
Texas	92	58
Mountain States	33	33
Montana	1	..
Idaho	..	..
[illegible]	2	1
[illegible]	20	21
[illegible]	3	2
Arizona	5	7
Utah	2	2
Nevada	..	..
Pacific States	67	43
Washington	5	2
Oregon	4	2
California	58	39
United States	616	407

FOREIGN

Congress on Rheumatology.—The Second European Congress of Rheumatology of the Ligue Européenne Contre le Rhumatisme, organized by the Spanish Society of Rheumatism, will be held in Barcelona, Spain, September 24-27. Congress papers will discuss non articular rheumatism, effects of pituitary and adrenal cortex hormones in rheumatic diseases, untrasonic therapy, ankylosing spondilitis, and brucellar rheumatism. The Spanish society is interested in the organization of a bibliographic exhibition of monographs and books edited during the last 20 years. Those who have edited such publications are invited to send a copy of each to (S.) Pedro Barcelo, General Secretary, Barcelona, Spain.

EXAMINATIONS AND LICENSURE

NATIONAL BOARD OF MEDICAL EXAMINERS

National Board of Medical Examiners: *Parts I and II.* Various Centers. Sept. 5-7 (Part I only). Applications must be filed at least thirty days prior to an examination. Ex. Sec., Mr. E. S. Elwood, 225 S. 15th St., Philadelphia.

INTERNATIONAL COLLEGE OF SURGEONS

Examinations for Certified Fellowship in the United States Chapter in General and Orthopedic Surgery, Chicago, Aug. 3-4. Sec., Dr. Arnold S. Jackson, 1516 Lake Shore Drive, Chicago 10.

EXAMINING BOARDS IN SPECIALTIES

American Board of Anesthesiology: *Oral.* Memphis, Oct. 14-17. Sec., Dr. Curtiss B. Hickcox, 80 Seymour St., Hartford 15, Conn.

American Board of Dermatology and Syphilology: *Written.* Chicago, March 1952. *Oral.* Chicago, May 1952. Final date for filing application is Feb. 1, 1952. Sec., Dr. George M. Lewis, 66 E. 66th St., New York 21.

American Board of Internal Medicine: *Written.* Various centers, Oct. 15. Final date for filing applications was May 1. *Oral.* The schedule of oral examinations for 1951 has been arranged on a regional basis as follows: New York, date to be announced, covering Maine, Massachusetts, New Hampshire, New York and Vermont. San Francisco, date to be announced, covering Arizona, California, Colorado, Idaho, Montana, New Mexico, Oregon, Utah and Washington.

Only candidates who have not taken an oral examination can be admitted under the schedule arranged thus far.

Closing dates for the filing of applications for examinations in New York and San Francisco to be announced.

Oral examinations in the subspecialties will be held at the same time and place and on the same distribution.

Exec. Sec., Dr. William A. Werrell, 1 W. Main St., Madison 3.

American Board of Neurological Surgery: *Oral.* Chicago, Oct. 25-26. *Oral.* Chicago, May 1952. Final date for filing applications for the May 1952 examination is Jan. 1, 1952. Sec., Dr. W. J. German, 789 Howard Ave., New Haven 4, Conn.

American Board of Obstetrics and Gynecology: *Written.* Feb. 1, 1952. Final date for filing applications is Nov. 1. *Oral.* Chicago, June 7-13, 1952. Final date for filing application is Feb. 1, 1952. Sec., Dr. Paul Titus, 1015 Highland Building, Pittsburgh 6, Pa.

American Board of Ophthalmology: *Written.* Twenty-five centers, Feb. 4-5, 1952. *Oral.* Chicago, October 8-13. Sec., Dr. Edwin B. Dunphy, 56 Ivie Road, Cape Cottage, Maine.

American Board of Orthopaedic Surgery: Final date for filing applications for the 1952 Part II examinations is Aug. 15, 1951. Sec., Dr. Harold A. Sofield, 122 S. Michigan Ave., Chicago 3.

American Board of Otolaryngology: *Oral.* Chicago, Oct. 8-12. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City.

American Board of Pediatrics: *Oral.* Buffalo, Oct. 26-28. Ex. Sec., Dr. John McK. Mitchell, 6 Cushman Rd., Rosemont, Pa.

American Board of Plastic Surgery: Denver, Oct. 27-29. Final date for filing of case reports is Aug. 30. Sec., Dr. Bradford Cannon, Office of the Board: 4647 Pershing Ave., St. Louis 8.

American Board of Preventive Medicine: *Written.* San Francisco, October 28. *Oral.* San Francisco, October 29. Sec., Dr. Ernest L. Stebbins, 615 North Wolfe St., Baltimore 5.

American Board of Proctology: Philadelphia, Nov. 17-18. Sec.-Gen., Dr. Louis A. Buie, 102-110 Second Ave., S.W., Rochester, Minn.

American Board of Psychiatry and Neurology: *Oral.* New York, Dec. 17-18. Final date for filing applications is Sept. 1. Act. Sec., Dr. David A. Boyd Jr., 102-110 Second Ave., S.W., Rochester, Minn.

American Board of Radiology: *Oral.* Washington, D. C., Sept. 17-22. Sec., Dr. B. R. Kirklin, 102-110 Second Ave., S.W., Rochester, Minn.

American Board of Surgery: *Written.* Various centers, Oct. 1951. Final date for filing applications is July 1. *Written.* Various Centers. March 1952. Final date for filing application is Dec. 1, 1951. Sec., Dr. J. Stewart Rodman, 225 S. 15th St., Philadelphia.

Board of Throacic Surgery: *Written.* Various parts of the country. Sept. 14, 1951. Final date for filing applications is July 15. Sec., Dr. William M. Tuttle, 1151 Taylor Ave., Detroit 2, Mich.

American Board of Urology: Chicago, Feb. 9-13, 1952. Final date for filing applications is Sept. 1. Sec., Dr. Harry Culver, 30 Westwood Rd., Minneapolis 16.

MEETINGS

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, The Homestead, Hot Springs, Va., Sept. 6-8. Dr. William F. Mengert, 2211 Oak Lawn Ave., Dallas, Texas, Secretary.

American Congress of Physical Medicine, Shirley-Savoy Hotel, Denver, Sept. 4-8. Dr. Walter J. Zeiter, 2020 E. 93d St., Cleveland 6, Executive Director.

American Hospital Association, St. Louis, Sept. 17-20. Mr. George Bugbee, 18 E. Division St., Chicago 10, Executive Director.

Colorado State Medical Society, Denver, Sept. 18-21. Mr. Harvey T. Sethman, 1612 Tremont Place, Denver 2, Executive Secretary.

Mississippi Valley Medical Society, Peoria, Ill., Sept. 19-21. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.

Montana Medical Association, Great Falls, Sept. 13-16. Mr. L. R. Hegland, 104 N. Broadway, Billings, Executive Secretary.

National Medical Association, Philadelphia, Aug. 20-24. Dr. John T. Givens, 1108 Church St., Norfolk 10, Va., General Secretary.

Nevada State Medical Association, Riverside Hotel, Reno, Sept. 13-15. Dr. Wesley W. Hall, 307 W. Sixth St., Reno, Secretary.

North Texas-Southern Oklahoma Fall Clinical Conference, Wichita Falls, Texas, Sept. 19. Dr. W. L. Powers, 517 Hamilton Bldg., Wichita Falls, Chairman.

Pennsylvania, Medical Society of the State of, Pittsburgh, Sept. 16-20. Dr. Walter F. Donaldson, 500 Penn Ave., Pittsburgh 22, Secretary.

Reno Surgical Society Conference, Riverside Hotel, Reno, Nev., Aug. 23-25. Dr. Olin C. Moulton, 130 N. Virginia St., Reno, Nev., Chairman.

Rocky Mountain Radiological Society, Denver, Aug. 9-11. Dr. Maurice D. Frazer, 1037 Stuart Building, Lincoln, Nebr., Secretary.

U. S. Chapter, International College of Surgeons, Palmer House, Chicago, Sept. 10-14. Dr. Arnold S. Jackson, 1516 Lake Shore Drive, Chicago, Executive Secretary.

Utah State Medical Association, Salt Lake City, Sept. 13-15. Dr. T. C. Weggeland, 42 S. Fifth East St., Salt Lake City, Secretary.

Washington State Medical Association, Seattle, Sept. 9-12. Dr. James W. Haviland, 338 White-Henry-Stuart Bldg., Seattle, Secretary.

INTERNATIONAL

European Congress on Rheumatism, Barcelona, Spain, Sept. 24-27. Dr. Gunnar Edstròn, Sweden, Secretary.

General Practitioners Study Club International, Rome, Italy, Sept. 12-15. Dr. John O'Connell, 10300 Lackland Road, St. Louis 14, Mo., U. S. A., President.

International Anesthesia Research Society, London, England, Sept. 3-7. Mr. R. W. Cope, University College Hospital, London W.C.1, England.

International Association of Allergists, Zurich, Switzerland, Sept. 23-29. Prof. A. S. Grumbach, Hygiene Institut der Universitaet Zurich, Gloriastr. 32, Zurich, Switzerland.

International Congress of Anesthesiology, Nursing School of the Salpiettre, 47 Boul de l'Hospital, Paris, France, Sept. 20-22. 12 rue de Seine, Paris 6^e, France, Secretariat.

International Congress on Entomology, Amsterdam, Holland, Aug. 17-24. Dr. J. de Wilde, 136 Rapenburgerstraat, Amsterdam, Secretary.

International Congress on Industrial Medicine, Instituto Superior Técnico, Lisbon, Portugal, Sept. 9-15. Dr. Luis Guerreiro, Instituto Nacional do Trabalho e Previdência, Praça do Comercio, Lisbon, Secretary General.

International Congress on Mental Health, Mexico City, Mexico, Dec. 11-19. Mrs. Grace E. O'Neill, Division of World Affairs, National Association on Mental Health, 1790 Broadway, New York 19, N. Y.

International Congress of Physical Medicine, London, England, July 14-19. Dr. A. C. Boyle, 45, Lincoln's Inn Fields, London, W.C.2, England, Honorary Secretary.

International Gerontological Congress, Hotel Jefferson, St. Louis, Mo., U. S. A., Sept. 9-14. Dr. John E. Kirk, 5600 Arsenal Street, St. Louis 9, Mo., Chairman, Program Committee.

International Poliomyelitis Congress, Copenhagen, Denmark, Sept. 3-7. Prof. Dr. Niels Bohr, Statens Seruminstitut, 80 Amager Blvd., Copenhagen S., Denmark, President.

International Society of Surgery, Paris, France, Sept. 24-29. Dr. L. Dejardin, 141, rue Belliard, Brussels, Belgium, Secretary General.

International Society for the Welfare of Cripples, Fifth World Congress, Stockholm, Sweden, Sept. 9-14. Mr. Donald V. Wilson, 54 E. 64th St., New York 21, N. Y., U. S. A., Executive Director.

Pan Pacific Surgical Association Congress, Honolulu, Hawaii, Nov. 7-19. Dr. Forrest J. Pinkerton, Suite 7, Young Bldg., Honolulu, Hawaii, President.

World Confederation for Physical Therapy, Copenhagen, Denmark, Sept. 7-8.

World Medical Association, Stockholm, Sweden, Sept. 15-21. Dr. Louis H. Bauer, 2 E. 103d St., New York 29, N. Y., U. S. A., Secretary General.

DEATHS

Copps, Lyman Alden ⊕ Marshfield, Wis.; born in Stevens Point, Wis.; May 14, 1889; Rush Medical College, Chicago, 1915; specialist certified by the American Board of Ophthalmology and the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; a founder of the Wisconsin and Upper Michigan Society of Ophthalmology; a member of the state medical advisory committee to the state board of vocational and adult education since 1949; served during World War I; president of the Marshfield Chamber of Commerce; a preceptor of the University of Wisconsin Medical School in Madison; at one time on the faculty of the University of Illinois College of Medicine in Chicago; president of the Marshfield Clinic since 1942; affiliated with St. Joseph's Hospital, where he was at one time chief of staff; recently appointed to the state board of health by the governor; died April 2, aged 61, of cerebral vascular occlusion.

Fuller, Earl William ⊕ Greystone Park, N. J.; born in Utica, N. Y., July 3, 1885; Albany (N. Y.) Medical College, 1908; an Associate Fellow of the American Medical Association; member of the Medical Society of the State of New York, American Psychiatric Association, Association for Research in Nervous and Mental Diseases, and the American Orthopsychiatric Association; fellow of the National Committee on Mental Health; specialist certified by the American Board of Psychiatry and Neurology; director of the Northern New Jersey Mental Hygiene Clinics, New Jersey State Hospital; consulting psychiatrist, outpatient department, Englewood (N. J.) Hospital; consulting psychiatrist, Children's Heart Unit, Victoria Foundation, Morris Plains; consultant, Mental Hygiene Commission, New Jersey State Department of Institutions and Agencies in Trenton; at one time superintendent of the Pennhurst (Pa.) State School; died May 16, aged 65, of coronary thrombosis.

Weinberger, Herbert Leon ⊕ New Orleans; born in Laurel, Miss., Oct. 25, 1901; Tulane University of Louisiana School of Medicine, New Orleans, 1926; formerly on the teaching staff of the Tulane Post Graduate School of Medicine, and later on the staff of Louisiana State University School of Medicine; specialist certified by the American Board of Internal Medicine; served on the staff of Touro Infirmary as senior in the department of gastroenterology, and later as chief of the service; formerly vice president of the Louisiana Society of Gastroenterology; member of the American Society of Tropical Medicine and the National Gastroenterological Association, serving as president of its New Orleans chapter; died in Touro Infirmary May 4, aged 49, of coronary thrombosis.

Jack, Frederick Lafayette, Boston; born in Boston in 1861; Harvard Medical School, Boston, 1884; specialist certified by the American Board of Otolaryngology; member of the American Medical Association and the American Laryngological, Rhinological and Otological Society, of which he had been vice president; first president of the New England Oto-Laryngological Society; past president and secretary of the American Otological Society; fellow of the American College of Surgeons; served on the staffs of the Massachusetts Eye and Ear Infirmary and Massachusetts General Hospital; died May 3, aged 90, of cerebral thrombosis.

Schreiner, Bernard Francis ⊕ Buffalo; University of Buffalo School of Medicine, 1909; an Associate Fellow of the American Medical Association; fellow of the American College of Surgeons; specialist certified by the American Board of Radiology; member of the Radiological Society of North America, American College of Radiology and the American Radium Society, of which he had been vice president; formerly instructor in surgery at his alma mater; served on the staffs of the Buffalo General Hospital, Roswell Park Memorial Institute, and Sisters of Charity Hospital; died May 8, aged 64, of coronary thrombosis.

Ausman, Carl Frederick, St. Paul; Northwestern University Medical School, Chicago, 1912; member of the American Medical Association; on the staffs of Mounds Park Hospital, Riverview Hospital, and St. Luke's Hospital, where he died May 23, aged 67, of hypostatic pneumonia and cerebrovascular accident.

Beyer, Hart ⊕ Pittsville, Wis.; Rush Medical College, Chicago, 1900; served as village health officer, for many years as city clerk, and as a member of the board of education; died April 15, aged 78, of coronary thrombosis.

Bierly, Fred, Elizabeth, Ind.; Kentucky School of Medicine, Louisville, 1908; served on the staff of St. Edward Hospital in New Albany; died May 11, aged 69, of coronary occlusion.

Bishop, John S., Portland, Ore.; Boston University School of Medicine, 1886; died March 24, aged 91.

Bowen, Charles Fred, Richland Center, Wis.; Milwaukee Medical College, 1897; died April 2, aged 82.

Bowen, William Sinclair, Washington, D. C.; University of Maryland School of Medicine, Baltimore, 1888; member of the American Medical Association; fellow of the American College of Surgeons; formerly clinical professor of obstetrics at the George Washington University School of Medicine; consulting obstetrician, Columbia Hospital for Women; died May 18, aged 84, of coronary thrombosis and arteriosclerosis.

Brennglass, Joachim ⊕ New York; Columbia University College of Physicians and Surgeons, New York, 1903; an Associate Fellow of the American Medical Association; died March 28, aged 80.

Briggs, Stanley J., Madison, Wis.; Rush Medical College, Chicago, 1901; member of the American Medical Association; died in Madison General Hospital March 15, aged 73, of carcinoma of the sigmoid.

Brinkman, George Franklin, Fort Lauderdale, Fla.; Ohio Medical University, Columbus, 1900; died April 11, aged 72, of arteriosclerosis.

Buttorff, Gordon Stephen ⊕ Louisville, Ky.; Indiana University School of Medicine, Indianapolis, 1923; assistant professor of medicine at the University of Louisville School of Medicine; member of the American Rheumatism Association and the Aero Medical Association; on the staffs of the St. Joseph Hospital, Kentucky Baptist Hospital, Kosair Crippled Children's Hospital, and St. Anthony's Hospital, where he died May 16, aged 52, of cerebral hemorrhage.

Carr, Percy Whitman, Boston; Harvard Medical School, Boston, 1905; died March 31, aged 69.

Conner, Homer Leigh ⊕ Lieutenant Colonel, U. S. Army, Santa Monica, Calif.; Harvard Medical School, Boston, 1900; served during World War I; entered the medical corps of the U. S. Army as a major in July 1920; retired June 30, 1937, with rank of lieutenant colonel, for disability in line of duty; died March 27, aged 74, of cerebral thrombosis and coronary thrombosis.

Daley, Lyle Miner, Hamilton, Mo.; St. Louis University School of Medicine, 1908; member of the American Medical Association; served during World Wars I and II; died in Polo, April 13, aged 66, of coronary occlusion.

Eddleman, Owen Albert, Benton, Ky.; Chattanooga (Tenn.) Medical College, 1902; member of the American Medical Association; served during World War I; died in the Riverside Hospital, Paducah, March 8, aged 74.

Hesser, John Jacob ⊕ Chicago; Magyar Kiralyi Pázmány Petrus Tudományegyetem Orvosi Fakultasa, Budapest, Hungary, 1909; clinical associate in the department of medicine, Rush Medical College from 1924 to 1934; member of the Illinois Selective Service System during World War II; on the staff of Edgewater and Manor hospitals; died March 30, aged 64, of acute myocardial infarction and adhesive pericarditis.

⊕ Indicates Fellow of the American Medical Association.

Howell, Katharine Myrta ⊕ Chicago; Rush Medical College, Chicago, 1913; specialist certified by the American Board of Pathology; member of the American Association of Pathologists and Bacteriologists, College of American Pathologists, Society of American Bacteriologists, and the American Society of Clinical Pathologists; on the staff of Michael Reese Hospital; died April 27, aged 67.

Humphrey, Thomas Field, Dayton, Ohio; University of Cincinnati College of Medicine, 1931; specialist certified by the American Board of Pediatrics; member of the American Academy of Pediatrics; affiliated with Good Samaritan and Miami Valley hospitals; died May 11, aged 52, of coronary thrombosis.

Hyde, William George, Milwaukee; Rush Medical College, Chicago, 1913; assistant medical director of Northwestern Mutual Life Insurance Company; died in Madison March 27, aged 65, of coronary thrombosis.

Jackson, Calvin Franklin ⊕ Bradshaw, W. Va.; Ohio State University College of Medicine, Columbus, 1927; member of the Maine Medical Association; served during World War I; died suddenly May 12, aged 52, of coronary thrombosis.

Jensen, Ingvald Johan, Chicago; University of Illinois College of Medicine, Chicago, 1922; member of the American Medical Association; died May 16, aged 58, of carcinoma of the prostate.

Lee, Richard Nicholas, Mount Blanchard, Ohio; Starling Medical College, Columbus, 1898; member of the American Medical Association; served on the school board and town council; affiliated with Findlay Hospital in Findlay; died May 17, aged 78, of coronary thrombosis.

Lochhead, John McLean, Indianapolis; Homeopathic Medical College of Missouri, St. Louis, 1894; died in Methodist Hospital May 15, aged 83, of hypostatic pneumonia.

Loescher, Walter Otto, St. Louis; American Medical College, St. Louis, 1914; died May 16, aged 61.

Lyons, George Canfield ⊕ Larchmont, N. Y.; University and Bellevue Hospital Medical College, New York, 1905; veteran of the Spanish-American War and World War I; for many years police surgeon; affiliated with New Rochelle (N. Y.) Hospital; died May 9, aged 71, of carcinoma of the bronchus.

McClelland, Joseph O., Maxton, N. C.; Medical College of Virginia, Richmond, 1908; member of the American Medical Association; past president of Robeson County Medical Society; past president and vice president of the Seaboard Airline Railway Surgeons; for many years surgeon for the Seaboard Airline Railway; affiliated with Baker Sanatorium and Thompson Hospital in Lumberton; died in a hospital at Lumberton May 8, aged 78, of cerebral embolism and Parkinson's disease.

Martin, George A. E., Adona, Ark. (licensed in Arkansas in 1903); died May 15, aged 94, of heart disease.

Martin, Leonard James, Asbury Park, N. J.; Howard University College of Medicine, Washington, D. C., 1935; member of the American Medical Association; served in the South Pacific during World War II; affiliated with Monmouth Memorial Hospital in Long Branch and Fitkin Memorial Hospital in Neptune; died May 15, aged 46, of a tumor of the lung.

Moberley, Paul Benton, Fort Smith, Ark.; University of Illinois College of Medicine, Chicago, 1941; member of the American Medical Association; served during World War II; affiliated with Veterans Administration Hospital (Kennedy), where he died May 12, aged 41, of periarteritis nodosa.

Murry, Abel Vance, Macon, Miss.; Tulane University of Louisiana School of Medicine, New Orleans, 1932; member of the American Medical Association; served during World War II; died in Lonoke, Ark., May 18, aged 44, of heart disease.

Nunemaker, Tunis ⊕ Portsmouth, Ohio; College of Physicians and Surgeons, Baltimore, 1901; on the staff of Mercy Hospital, where he died May 16, aged 78, of carcinoma of the stomach and cerebral hemorrhage.

Patrick, Fred Edward Jr., Kansas City, Mo.; University of Kansas School of Medicine, Kansas City, Kan., 1943; served during World War II; died May 16, aged 32, of cerebral hemorrhage.

Richmond, Henry Charles Tyler, Louisville, Ky.; Hospital College of Medicine, Louisville, 1907; member of the American Medical Association; fellow of the American College of Surgeons; served in France during World War I; affiliated with Jewish Hospital, where he died May 9, aged 66, of heart disease.

Rogers, Herbert Wilson ⊕ Norfolk, Va.; born in Nassawadox, Va., Aug. 26, 1892; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1916; member of the Southeastern Surgical Congress; past president of the Norfolk County Medical Society; for many years member of the school board of Norfolk; member of the board of directors of the Virginia Academy of General Practice; affiliated with Leigh Memorial Hospital and Norfolk General Hospital, where he died May 8, aged 58, of uremia.

Roth, Harry A. ⊕ Long Beach, Calif.; McGill University Faculty of Medicine, Montreal, Canada, 1930; affiliated with St. Mary's Long Beach Hospital and Seaside Hospital, where he died May 12, aged 43, of coronary thrombosis.

Roth, Lionel Andre, Midland, N. C.; College of Medical Evangelists, Loma Linda-Los Angeles, 1945; interned at Washington Sanitarium and Hospital in Washington, D. C.; died May 16, aged 31, of injuries received in an automobile accident.

Schierge, Ernest E., Plainfield, N. J.; Bellevue Hospital Medical College, New York, 1890; formerly affiliated with Municipal Sanatorium of the Department of Health, New York City, in Otisville; died in Muhlenberg Hospital May 15, aged 83, of cerebral thrombosis.

Shoemaker, John Asher, Gallipolis, Ohio; University of Pennsylvania Department of Medicine, Philadelphia, 1902; contract surgeon for the U. S. Army during World War I; at one time practiced in Berea, where he was co-founder and for many years a member of the staff of Community Hospital; served on the staff of the Gallipolis State Institute; died May 2, aged 70, of coronary disease.

Spottswood, Edward W., Missoula, Mont.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1893; member of the House of Delegates of the American Medical Association in 1920 and 1921; for many years affiliated with the Northern Pacific Hospital; died May 13, aged 85.

Swanson, Robert Ralph, Minneapolis; University of Minnesota Medical School, Minneapolis, 1927; member of the American Medical Association; died May 14, aged 49.

Temple, Henry Curtis, Alliance, Ohio; St. Louis College of Physicians and Surgeons, 1888; on the staff of Alliance City Hospital; died May 8, aged 93, of congestive heart failure.

Warren, John Freemont ⊕ Ithaca, N. Y.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1920; past president of the Tompkins County Medical Society; affiliated with Ithaca Hospital; died May 13, aged 55, of coronary thrombosis.

Werner, Emil August, Panama City, Fla.; Baylor University College of Medicine, Dallas, Texas, 1917; served during World War II; formerly affiliated with the Veterans Administration; died in Pensacola, Fla., May 6, aged 60, of carcinoma of the kidneys.

Wheat, Thomas Adrian, Lewisburg, Tenn.; University of Tennessee College of Medicine, Memphis, 1938; member of the American Medical Association; medical superintendent of Wheat Memorial Hospital; died May 9, aged 36, of virus encephalitis.

Whelan, Raymond Edward, Youngstown, Ohio; Western Reserve University Medical Department, Cleveland, 1890; also a graduate in pharmacy; fellow of the American College of Surgeons; veteran of the Spanish-American War; at one time personal physician to the late President Taft; past president of the Mahoning County Medical Society; one of the founders and for many years emeritus chief of staff of St. Elizabeth's Hospital, where he died May 6, aged 82, of diverticulitis of the esophagus and bronchopneumonia.

Wright, Elihu Burritt, Pierce City, Mo.; Barnes Medical College, St. Louis, 1898; served as mayor of Pierce City and as president of the school board; died in St. John's Hospital, Springfield, May 8, aged 89.

GOVERNMENT SERVICES

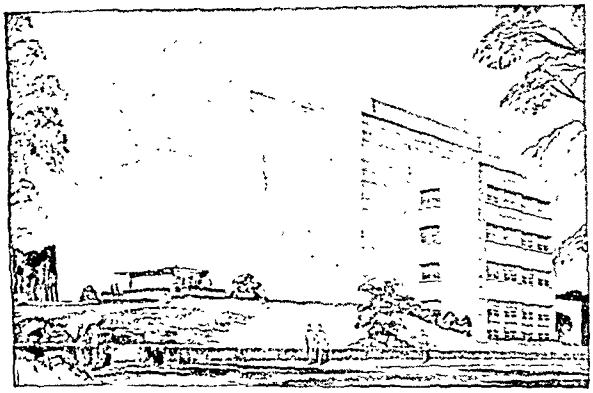
ARMY

New Institute of Pathology.—Ground breaking ceremonies for the new Armed Forces Institute of Pathology took place July 10, at the Army Medical Center, Washington, D. C.

Among those who participated were Brig. Gen. Elbert DeCoursey, Director of the Institute; Rear Admiral H. L. Pugh, Surgeon General of the Navy; Maj. Gen. H. G. Armstrong, Surgeon General of the Air Force; Vice Admiral Joel T. Boone, MC, USN, (ret.), Chief Medical Director of the Veterans Administration; and Dr. Leonard Scheele, Surgeon General, U. S. Public Health Service. Surgeon General Armstrong of the Army was the principal speaker.

The $7,250,000 structure will take about two years to build. The exterior walls will be of concrete 12 inches thick, and three of its eight floors will be underground. Except for the part which will house offices, the building will be entirely without windows and will be equipped with special high intensity, controlled lighting. Also included are plans for central closed circuit television facilities which are to be used in teaching both Army and civilian students.

The air-conditioned building will provide about 200,000 square feet of working space.



Architect's conception of the new Institute of Pathology.

During the past half century, five different attempts have been made to obtain funds necessary to construct new quarters for the Armed Forces Institute of Pathology, which before unification of the military establishment had been known as the Army Medical Museum and the Army Institute of Pathology. Now located at 7th and Independence Avenue, Washington, D. C., the Institute occupies a structure built in 1887. Constantly increasing demands for the services offered by the Institute have made it imperative that adequate, modern housing be obtained if those services were to be maintained at the necessary high standards.

Under the Army Surgeon General's Office, the Armed Forces Institute of Pathology is made up of four departments. The Laboratories of Pathology furnish consultation and diagnosis services on specimens submitted by military and other federal hospitals, medical schools, and civilian hospitals and medical institutions all over the world. The American Registry of Pathology, operating under the auspices of the National Research Council, conducts investigations in specific fields of pathology. All of its materials and records are available to medical officers, graduate and other qualified students, and other professional investigators. The Medical Illustration Service prepares medical exhibits and material for use in training. The Medical Museum collects and preserves gross material, instruments, and other items of historic medical significance.

Dr. Edsall to Aid Army Graduate School.—Dr. Geoffrey Edsall, head of the department of microbiology, Boston University School of Medicine, has been granted a one-year leave of absence to serve as head of the Immunological Division, and director of the Division of Biologic Products, at the Army Medical Graduate School, Washington, D. C. Dr. Edsall has been a pioneer in vaccine and serum development, and in the organization of large-scale civilian blood programs and the utilization of blood fractions in the arresting of disease. Since joining the medical faculty of the university in July, 1949, he has been doing research on simplified methods of immunizing adults against diphtheria and tetanus. Previously, he was director of the Division of Biological Laboratories, Massachusetts Department of Public Health.

Personal.—Maj. Richard H. Baker, MC, has been assigned as professor of military science and tactics in charge of the Medical Reserve Officers Training Corps at the St. Louis University School of Medicine. Maj. Baker was orthopedic surgeon in a mobile army surgical hospital unit in Korea from July to December 1950, when he returned to Fitzsimons General Hospital, Denver, to complete his orthopedic residency training begun in 1949 shortly after joining the regular army.

PUBLIC HEALTH SERVICE

Malaria Approaching Extinction in United States.—More than 98% of the American houses sprayed with DDT (dichloro-diphenyl-trichloro-ethane) between 1945 and 1950 have been kept free of malaria mosquitoes, according to the Communicable Disease Center of the Public Health Service. State health departments and CDC applied more than 6,220,000 doses of the insecticide during that six-year period, according to a report by Dr. George H. Bradley, chief of entomologic services, and Christ A. Hansen, chief of engineering services, both of the Communicable Disease Center.

"It is significant that the percentage of control obtained in 1950 compares favorably with that for previous years," they said. "Thus we may conclude that resistance to DDT has not yet become a problem in our antianopheline mosquito control program." The extensive use of DDT residual, or long-lasting, spraying for malaria control in the United States was begun in 1945. About 700,000 house spray applications were made during that year; 1,100,000 in 1946; 1,278,000 in 1947; 1,300,000 in 1948; 1,000,000 in 1949; and 842,000 in 1950. "Malaria appears to be approaching extinction in the United States," Dr. Bradley and Mr. Hansen concluded. "Only 2,214 cases were reported for 1950, as compared to 62,763 cases reported in 1945."

Even so, the reported cases give an exaggerated picture of malaria incidence, they concluded. During the past year epidemiologists of the Communicable Disease Center have made a concerted effort to evaluate all reported cases of malaria to determine their validity. Of 676 supposed cases appraised in seven southeastern states, only 26 were proved to be parasite-positive. Of these 26 positive cases, only 6 were considered to have been transmitted within the United States.

AIR FORCE

Dr. Boothby Goes to New Mexico.—Dr. Walter M. Boothby, for the past eight months advisor for research at the Air Force Medical School, Randolph Field, Texas, has left the school to take over a new post at the Lovelace Foundation in Albuquerque, N. M. (The Journal, Dec. 16, 1950, p. 1382). At the Lovelace Foundation Dr. Boothby will organize an aviation physiology laboratory that will work in cooperation with the physiology department of the University of New Mexico.

FOREIGN LETTERS

ITALY

Surgery of the Heart.—At a meeting of the medical academy *Filippo Pacini* in Pistoia, Prof. Piero Valdoni, who holds the chair of surgical pathology at the University of Rome, discussed surgery of the heart. This work, begun recently at the university, required various techniques, such as heart catheterization, study of oxygen in the blood, cardioangiography, use of the electro-ionic manometer, fluorocardiography, and ballistocardiography. To these studies were added capillaroscopy, examination of the fundus, examination of the circulating blood and the interstitial fluids, hemoglobin exchange, and sternal puncture.

Cardiosurgery has been of practical interest since Gross performed the first successful ligation of patent ductus arteriosus, some 10 years ago. The development of new methods today permits radical cure in some types of cardiac disease. Further progress will be obtained when the mechanism of the heart can be reproduced by a suitable apparatus, similar to those appliances suggested by Tosatti, Tonelli, and Provenzale.

These appliances oxygenate the blood of the vena cava, which is then poured back into the aorta. In this way the cardiopulmonary action could be substituted, and it would be possible to perform the operation on a bloodless organ. The practical realization of this system is still opposed by remarkable difficulties. The destruction of red blood corpuscles, which reaches 20%, must be eliminated; also removal of carbon dioxide from the blood must be effected. Prof. Valdoni explained then the technique to be followed in the treatment of stenosis of the aortic isthmus. He believes that one should operate on the patients soon, by resecting the stenotic portion and suturing the two ends.

Valdoni, in discussing congenital cardiopathies, classified them as cardiopathies with or without cyanosis and cardiopathies with late cyanosis. The tetralogy of Fallot has a higher incidence among the English-speaking population, while in Italy the Eisenmenger complex seems to be more frequent. The speaker had operated on 26 patients with Fallot's disease, with a death rate of 16%.

The diagnosis of pulmonary stenosis can be established safely by surgical exploration, i. e., by exposure of the right ventricle and lowering the finger into the pulmonary artery, which, being flexible, retroflexes and allows the exploring finger to reach the valvular orifice. The dilatation is performed after cardiac incision, with the use of dilators similar to Hegar's dilators or flat leaf-shaped dilators. In mitral stenosis the diagnosis may be made by means of digital exploration through the auricle, and the operation consists in the digital laceration of the commissures. Intervention is associated with the risk of mobilizing clots, which may result in the formation of emboli blocking the aortic bifurcation. Patients with severe decompensation and weak myocardium should not be operated on.

Ophthalmologic Association.—At the 43d general convention of the Swiss Ophthalmologic Association, Professors Bietti and Siliprandi of Pavia presented a report on experimental opacities of the crystalline lens produced by hypoglycemia. The speakers observed that within a few hours partial or total, unilateral or bilateral, opacities of the crystalline lens may result from injection of 8 to 10 mg. galegine (the active factor of Galega officinalis). These opacities can be observed in experimental animals; the opacities are present for a few minutes before death. The cataract develops more easily in rats made diabetic by the administration of alloxan. The production of the opacities seems to be due to the great hypoglycemic action of galegine, rather than to its toxicity. The phenomenon seems to be of osmotic origin and related to the compensatory increase of the sodium chloride content in the aqueous humor. Therefore, the process that leads to the cataract would be a late phase of the one leading to deficient refractive power in diabetics given too vigorous treatment. As a practical corollary to these animal experiments the speakers cautioned against treatment with insulin of diabetic patients who present an initial cataract.

Mechanism of Vitamin D_2 Action.—Dr. Candola presented to the Medico-Surgical Association of Pavia two papers on studies that he made on the mechanism of vitamin D_2 action in the therapy of cutaneous tuberculosis.

The first paper referred to the in vitro action of vitamin D_2 on the tubercle bacillus. The purpose of these studies was to ascertain whether this vitamin added to the culture medium is able to influence or to hinder the development of Mycobacterium tuberculosis. Kirchner's synthetic culture medium, to which normal human serum was added, was employed. The vitamin was added in quantities varying from 500 to 4,000 I. U. per cubic centimeter of culture medium.

The second paper was concerned with the action of blood serum of patients treated with vitamin D_2, on the development in vitro of Myco. tuberculosis. Influence of vitamin D_2 could not be shown on the development in vitro of Myco. tuberculosis, either when the vitamin was added directly to a culture or when it was introduced into the serum of the patients. The speaker concluded that the mechanism of vitamin D_2 action in the therapy of cutaneous tuberculosis remains obscure, but certainly it is not connected with a direct action of the drug on the bacteria.

NORWAY

The Future of the Medical Profession.—Dr. Peter M. Holst, who is at the head of a section of the Oslo City Hospital at Ullevaal, recently gave an address in which he discussed both the influence of compulsory health insurance on the nation and the outlook for the medical profession. He pointed out that compulsory health insurance has expanded enormously since 1912 and that no political party in the country is likely to oppose the fundamental principles on which it is based. He said, in effect: Norwegian doctors are so familiar with health insurance that they ought to be able to give an opinion on it. He claimed that voluntary health insurance is usually an expression of the qualities of responsibility and survival instinct, every wise and provident person being willing to offer much to avoid misfortune. But he queried the proposition that the same can be said of compulsory insurance, though he did not go so far as to insist that compulsory insurance has a directly destructive effect on these qualities. Norwegian doctors are, however, in possession of considerable experience giving support to the attitude of the medical profession in the United States. Dr. Holst pointed out that, though the expectation of life has constantly increased in Norway, there has been no corresponding reduction in the sickness rate, to judge by health insurance statistics. In Oslo, for example, the number of days for which monetary compensation was given for sickness rose per insured person from six in 1915 to 10 in 1947. The sickness rate in 1947 among some 41,000 male manual workers was nearly twice as high as it was among some 28,000 male office workers. The sickness rate was approximately 50% higher among women than among men, and among some 19,000 women manual workers it was about three times as high as among male office workers. The sickness rate was also much higher in the towns than in the country districts, and several times higher among persons enjoying compulsory insurance than it was among persons taking out voluntary health insurance. These great differences do not reflect, in Dr. Holst's opinion, any corresponding differences in actual sickness rates, but differences in the civic sense of re-

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The items in these letters are contributed by regular correspondents in the various foreign countries.

sponsibility, giving support to the American point of view. Very many compulsorily insured persons seem inclined to exploit their rights to the utmost.

With regard to the future of the medical profession, Dr. Holst said that it has every reason to be gloomy, because there is a rapid deterioration of both economic and professional standards. At the present time "no doctor is able by his work as such to assure himself a care-free old age." Even those who can look forward to a pension in their old age know that it will be inadequate for the maintenance of their former standard of living. So many doctors are obliged to cling to a practice which gradually diminishes with advancing years. At the present time, some 10% of Norwegian doctors are over the age of 70; this percentage is bound to rise. The younger doctors who wish to specialize often find the road blocked by competition. In Dr. Holst's own section of the Oslo City Hospital, there were recently so many applicants for appointments to be held by would-be specialists that it would have taken some 10 years to give all of them their chance.

The Prognosis for the Tuberculin Convertor.—At what age does the conversion of a negative to a positive tuberculin reaction indicate the most sinister outlook for the person concerned? And is the outlook on conversion worse for a person living in contact with infectious cases of tuberculosis than for a person living in a nontuberculous environment? To answer these two questions, Dr. G. Hertzberg and Dr. L. Riddervold have undertaken much painstaking research in the tuberculosis department of the Oslo public health service, where they have scrutinized the records and cards of some 200,000 persons examined for tuberculosis between 1932 and 1948. In the course of this investigation, which was started in 1945, they have found 2,310 cases of definite tuberculin conversion, i. e., a change within a year from a negative Pirquet or Mantoux reaction to a positive Pirquet reaction. All these subjects were radiologically examined when conversion was found and later at regular intervals. After an observation period ranging from 1.9 to 4.5 years, the subsequent fate with regard to the outbreak of tuberculosis in these subjects was analyzed. It was found that the prognosis was worst for the persons whose conversion was discovered between the ages of 20 and 29. It was somewhat better between the ages of 13 and 19 and up to age 2 years. The prognosis was best between the ages of 3 and 12 years and comparatively good after the age of 30. As for the influence of an infectious tuberculosis environment on the prognosis, it was found to be worse for those with conversion who had been in contact with open cases of tuberculosis than for patients with conversion living in a tuberculosis-free environment. But this difference was definite only among subjects with conversion under age 20. Drs. Hertzberg and Riddervold have given statistical proof of conclusions which have hitherto been based mainly on general impressions derived from clinical experience. They are not, however, sure that, if their observation period were to be considerably prolonged, they would continue to arrive at exactly the same conclusions.

Death of Prof. P. Bull.—Prof. P. Bull, who died on Jan. 31, 1951, at the age of 81, enjoyed a world-wide reputation as a pioneer in surgery of the lungs. His four years of work at the turn of the century at the Pathological-Anatomical Institute in Oslo gave him a background of morbid anatomy which served him in good stead for the rest of his career. His doctorate thesis in 1905 dealt with teratoid tumors. In 1912 he was appointed professor of surgery; in 1918 he was elected a member of the Academy of Sciences, and in 1924 he became chairman of the Norwegian Medical Society. He was honorary member of several medical and surgical societies in the various Scandinavian countries and corresponding member of medical societies in Austria and France. The Association of Surgeons of Great Britain and Ireland and the Royal College of Surgeons of England made him an honorary member.

Prof. Bull's first thoracoplastic operation was performed in 1914. Thenceforth and till 1930, he continued to publish studies on this particular subject. In 1922, he was invited by the British Medical Association to lecture at Glasgow on extrapleural thoracoplasty for pulmonary tuberculosis. On this occasion he presented three patients whom he had brought with him from Norway. In the following year, he gave the opening address on thoracoplasty at a meeting of the Royal Society of Medicine in London. As far back as 1908, he began his campaign for immediate operation for acute appendicitis. His opponents were not only physicians but also some surgeons, and it took several years and many heated debates at meetings of the medical society to convince his critics of the errors of their ways. He was remarkably successful as a teacher, not least because he was never afraid of illustrating his arguments by the mistakes he had made himself. One of his biographers, Dr. Andreas Tanberg, has explained why Prof. Bull resigned his professorship of surgery as early as 1928, after he had held this appointment only 16 years. He took this step largely to escape having to act as an examiner two hours a day every day for three months in the year. Rid of his duties as teacher and examiner, he was free to take charge of the surgical department of a large hospital in Oslo.

ISRAEL

Foreign Student Problems of Hebrew University.—As in years past, the students from abroad who are attending the Hebrew University reflect, in part, the nature of the current immigration to Israel. Dr. Alexander M. Dushkin, dean of undergraduate studies, discussed some of the problems that have arisen in this connection and the steps taken by the university to deal with them. He said that those who admit the new students to the Hebrew University and give them counsel have been struck by the new types of student who have been coming from the Moslem countries and from behind the Iron Curtain, particularly from Iraq, Turkey, Egypt, Rumania, and Poland. Changes in student types are no new phenomenon at the Hebrew University. Every turn in the affairs of the Jews has been reflected in the type of students applying for admission. To that extent, at any rate, the Hebrew University has indeed been the university of the Jewish people.

The various new student types differ widely in cultural levels and backgrounds, in the content and quality of their education. American students, despite difficulties of language and unfamiliar academic mores, quickly "learn the ropes." The students from behind the Iron Curtain who have been trained in the communist school program, bring with them an education that is uneven and "spotty." But their academic habits seem to be essentially sound, and they, too, adapt themselves readily to university study. The Iraqis, on the other hand, present a special problem; with some notable exceptions their academic standards are low and their work habits poor.

Whatever differences exist among the new foreign students, they are nearly all, unfortunately, ignorant of Jewish life and culture. This year a small but growing number of Druze and Arab (non-Jewish) students have enrolled at the university, with no knowledge of Jewish matters. Were the Hebrew University to follow the practice of other universities, these students would be required to prepare themselves adequately outside the university, at least in the Hebrew language. But the Hebrew University, like the Jewish state, is committed wholeheartedly to facilitate free, unlimited immigration, to encourage students from abroad, and to give equal opportunities to all students, Jewish and non-Jewish. Consequently the problem of preparing these students must be met by the university itself.

Medical Students Graduate.—The first 14 medical students to graduate from the Hebrew University have completed their internship at the Beilinson Hospital and have begun to practice as private physicians or as members of medical institutions.

Hypopotassemia and Insulin.—The relation between potassium content of the blood and the metabolic changes in diabetes under the influence of insulin has been repeatedly described. In a clinical paper, S. Brandstetter (*Harefuah*, March 15, 1951) reports, for the first time in Isreal, a particularly characteristic case. A woman, 58, with diabetes of 21 years' duration, was admitted to the hospital in diabetic coma with blood sugar of 871 mg. per 100 cc. After administration of 660 units of insulin during the first 24 hours and 7,600 cc. of isotonic sodium chloride by infusion, the blood sugar was reduced to 200 mg. per 100 cc. The patient regained consciousness, but severe asthenia and dyspnea developed. Difficulty of movement resembled a cataleptic state. Breathing was very feeble. The potassium level on admission was 17 mg. per 100 cc.; after the patient regained consciousness, it fell to 6.8 mg. Oral administration of 11 gm. of potassium chloride fully changed the clinical picture; movements were again normal, and breathing was regular. Hypopotassemia in diabetic coma is probably caused by potassium leaving the cell and entering the blood serum, whence it is excreted by the kidneys. Inappetence and vomiting further alter the potassium level. In this connection, the report of Dr. Groen, Amsterdam, a guest lecturer at the medical school in May, 1951, is of interest. He showed that, in the isolated diaphragm of the living rat, glucose utilization as well as potassium uptake is increased by addition of insulin.

National Social Insurance Plan.—The draft of a new social insurance scheme, to cover more than one million persons by the end of 1953, has been completed and is to be submitted to the cabinet within the next few days. The scheme, which under the proposed law is to be administered by a National Social Insurance Authority, will provide free medical service and hospitalization to the insured and their dependents; maternity benefits; old age, widow, and orphan pensions, and disability benefits for persons unable to continue work for reasons of health.

According to the draft, the scheme is to be implemented in three stages. The first phase, due to come into force in October, 1951, will extend compulsory insurance to all wage and salary earners and members of cooperatives and will cover about 300,000 persons (including dependents, about 600,000 persons). The second phase, which will go into effect by June, 1952, will cover all self-employed persons (e. g., craftsmen, shop owners). The third phase will provide for compulsory insurance of the entire population, for old age, widow, and orphan pensions. Taking into account the anticipated increase of population, the scheme will by that time cover 450,000 directly insured persons representing, with dependents, a population of more than a million.

Maternity benefits will include free hospitalization, 12 weeks' paid leave, and a layette for directly insured women. Wives of insured persons will receive the same benefits but with paid help for the household in place of the paid leave granted to insured women. Sickness benefits include medical care and rehabilitation. Pensions will be granted in cases of incapacity and will be calculated according to the degree of disability and size of family without reference to previous salary. Old age pensions will be at a flat rate.

It is anticipated that insurance subscriptions will be paid into the Insurance Authority, which will then settle the expenses of the various existing sick funds providing the medical services. The authority will take over work accident insurance from the private insurance companies and will also directly disburse all payments and benefits made under the scheme.

Work on the scheme began about two years ago, when the "Kanev Committee" was appointed to prepare a social insurance plan. The recommendations of the Kanev Committee were studied by the government in March, 1951, and passed to a second committee. It is anticipated that the present expenditure of IL. 25m. on various types of social insurance will be sufficient to cover the charges of the new scheme and that no additional burden will be placed on the national economy or the treasury.

New Hospital for Crippled Children.—The Society for Crippled Children recently opened a new hospital in the Katamon quarter of Jerusalem. The site was provided by the government, while the cost of building repairs was borne by the society with the help of donations. The new hospital, under the medical management of Dr. E. Heilbronner, has 35 beds. It provides treatment and accommodation for victims of poliomyelitis. Another wing is under construction, which will increase the number of beds to 65 and ultimately to 100. The official opening will take place as soon as the installation of the new medical equipment and furniture is completed.

CORRESPONDENCE

NATIONAL CANCER INSTITUTE

To the Editor:—I wish to compliment the American Medical Association for its Special Bulletin No. 1, containing Mr. George E. Connery's excellent account of our activities in Bethesda titled "A Report on the National Cancer Institute." I note an omission, however, which I believe should be incorporated in the report in order to indicate the complete scope of the program of the institute. We have two clinical research programs, one at the Laboratory of Experimental Oncology in San Francisco and the other at the United States Marine Hospital in Baltimore.

The Laboratory of Experimental Oncology, of which Dr. Michael B. Shimkin is chief, is a cooperative project on neoplastic diseases with the University of California School of Medicine. With the cancer patient as the focal point of investigation, the work of this laboratory is oriented along four broad approaches: (1) experimental therapy, providing clinical material for other studies as well as permitting evaluation of such procedures on neoplastic diseases; (2) physiology, particularly cardiovascular and respiratory physiology of patients with neoplastic diseases; (3) biochemistry, including metabolic studies on cancer patients, and investigations of specific biochemical reactions, and (4) the study of protein fractions of cancer and normal tissues of human and animal origin, utilizing physicochemical and immunochemical techniques.

Some of the experimental therapy projects now being investigated at the Laboratory of Experimental Oncology concern the effect of virus infections on neoplastic growth, therapy of inoperable visceral and regional metastases by intra-arterial catheterization, and evaluation of nitrogen mustard, triethylene melamine and other materials in the treatment of clinical cancer. Among other contributions to knowledge of cancer, clinical studies by this group have clarified the role of blood histamine in myelogenous leukemia, have added information on the fate of normal and leukemic white blood cells, and have shown that the sulfhydryl content of blood is significantly reduced in patients with cancer.

The second clinical program includes a cooperative study of chemotherapeutic agents with the Tumor Clinic of the United States Marine Hospital in Baltimore. Dr. Ezra M. Greenspan, who heads this program, is investigating new chemotherapeutic and diagnostic methods in tumor patients, conducting metabolic and biochemical studies in patients and animals after administration of potential carcinolytic substances, and studying the mechanism of action of established anticancer agents in experimental animals.

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RUTABAGAS, TULIP BULBS AND GOITER

To the Editor:—In the editorial "Nutrition and Goiter" (*J. A. M. A.* **145**:824 [March 17] 1951) there appeared the statement "Also in the same country, monks who subsisted on rutabagas and tulip bulbs were found to have developed goiter." The authority given was Greer (*Physiol. Rev.* **30**:513, 1950), thus giving the reader the impression that Greer had himself made this observation. Actually, he relied on the report by Astwood of a communication said to have been made to the latter by H. P. Himsworth, of London, who is said to have seen the monks. A somewhat different account is given by Means (The Thyroid and Its Diseases, ed. 2, New York, n. d., p. 189). In that, an unnamed Belgian colleague of Dr. Himsworth is made accountable for the story and the monks are said to have had little but rape seed and cabbage.

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BUREAU OF MEDICAL ECONOMIC RESEARCH

SURVEY OF PHYSICIANS' INCOMES

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and
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In April, 1950, the Bureau of Medical Economic Research of the American Medical Association and the Office of Business Economics of the United States Department of Commerce jointly initiated a survey of the 1949 incomes of physicians from professional services, excluding incomes from other sources. The first report on this survey was published this week in the July, 1951, issue of the *Survey of Current Business*, United States Department of Commerce.[1] The tabulations and interpretations in that current article are the responsibility of the Department of Commerce although the Bureau of Medical Economic Research was given the opportunity to comment on the manuscript of the article prior to its publication. The designing of the questionnaires, the selection of samples of physicians by name, and the mailing of the questionnaires was a joint responsibility. Later on, all of the returned questionnaires will be sent to the Bureau of Medical Economic Research for further study and analysis. From the very inception of this joint undertaking a fine and genuine spirit of cooperation and mutual criticism has prevailed between the staffs of the Bureau of Medical Economic Research and the Office of Business Economics.

We want to thank the more than 55,000 of the 125,000 physicians who received questionnaires for taking the time and trouble to fill out and return the schedules. This remarkable and unprecedented number and percentage of returns in a survey of professional incomes has exceeded all expectations and gives the study an importance unique in the history of mail income surveys. We should also like to thank the officers and editors of state and county medical societies for their assistance.

THREE QUESTIONNAIRES

Three questionnaires were employed. A white form was sent without a follow-up to 100,000 physicians—virtually every other name in the punch-card files of the Bureau of Medical Economic Research. Our basic reason for sending out so many white questionnaires was to provide a large body of data without resorting to follow-up mailings. Some 42,000 of these were returned but approximately 12,000 returns were excluded from this first analysis because they came from retired and other physicians not in practice, interns, residents and fellows-in-training, military physicians, and physicians whose major source of income was from a medical school or because they were defective; these groups of physicians were to be excluded from the study but their names could not be removed from the original mailing lists.

A buff-colored questionnaire, identical in form with the white questionnaire, was sent to 10,000 physicians selected at random from among those who did not receive white questionnaires. On the outside of the return envelope was the serial number which the Bureau of Medical Economic Research has assigned to that particular physician. By checking off these code numbers in the Department of Commerce as the returns were received, it was possible for the Bureau of Medical Economic Research to address two follow-ups to those who did not respond to the first mailing; this procedure also protected the secrecy of the returns. Except for the "Technical Notes" at the end of his article, Weinfeld makes no reference to the data derived from the buff questionnaires. When we obtain the returned questionnaires from Washington we shall check them against our completed punch-card files in order to determine the representativeness—group for group, not person for person—of the returned buff questionnaires against the universe of the 10,000 physicians to whom they were mailed. In addition, we hope to obtain an almost 100 per cent response to the same income questions from a small random sample of the physicians who did not reply in order to compare the new data with the data on the buff questionnaires which have already been returned to the Department of Commerce. When this step is finished, we shall have a great quantity of information with which to check the tables prepared by Weinfeld. This division of labor was agreed upon before the survey started.

A green questionnaire was sent to 15,000 physicians selected at random from those who did not receive either a white or a buff questionnaire and the code number procedure was employed for the purpose of addressing two follow-ups. The green questionnaire requested data for the years 1945 through 1948 in addition to 1949; the Office of Business Economics needed these data for 1945-1948 for other statistical series.

Thus this article in the current issue of the *Survey of Current Business* has an extremely broad base. On these grounds alone this survey is not in the traditional small sample category; roughly, two out of five physicians responded.

It is very difficult to provide a brief summary of this long article with its 23 tables and three charts. In a word, this study indicates that the average physician has been moving up the inflationary ladder about as rapidly as the average American.

GENERAL AVERAGES

The average (mean) 1949 net income from medical practice of the 30,000 physicians whose returned questionnaires were analyzed was $11,058—see row 1, Table A. This was 60.4% of the average (mean) gross income of $18,316. The median net income reported was $8,835; that is, one-half of the physicians reported net incomes of less than $8,835 and one-half reported higher incomes. These are the two over-all averages to be kept in mind. They are based on all replies, which means that they came from physicians of all classes and types except the excluded classes noted above; for convenience we shall use the term "all" physicians in referring to data from the 30,000 replies. In this summary we shall stress the means, although many statisticians will consider the medians more representative values in the various distributions of physicians' incomes.

Of the 30,000 physicians reporting, 23,000 were in independent practice (derived more than 50% of their professional income from fees from independent practice); their mean net income in 1949 was $11,858 and their median income, $9,668. The remaining 7,000 of the 30,000[2] were engaged in salaried practice (received less than 50% of their professional income from fees); their mean net income was $8,272 and their median net income, $7,555.

The 30,000[2] replies were also separated into three categories: (1) non-salaried practice (20,000 returns) for which the mean was $11,744 and the median, $9,561; (2) part-salaried practice (5,000 returns) for which the mean was $10,928 and the median, $8,760; and (3) all-salaried practice (5,000 returns) for which the mean was $8,434 and the median, $7,678.

Before further major breakdowns of the data are presented, several historical comparisons may be useful in providing a general setting. Since more data from the past are available for non-salaried physicians, who in 1949 reported higher average net incomes than did all physicians, the historical comparisons, although limited, can best be made of their incomes. On the basis of Department of Commerce surveys for 1935-1939, Weinfeld concludes that the mean net income of non-salaried physicians was 186% higher in 1949 ($11,744) than in the period 1935-1939 ($4,100), the most frequently used base period in economic reports. Because the incomes of salaried physicians have apparently not risen as rapidly since the base period as the incomes of independent physicians, it follows that the in-

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[1] Weinfeld, William: Income of Physicians, 1929-49. A reprint of this article from the Survey of Current Business may be obtained without charge from the Bureau of Medical Economic Research, American Medical Association, 535 N. Dearborn St., Chicago 10.

[2] Precisely, the total number of returns analyzed was 29,878 and the two groups numbered 23,213 and 6,665, not 23,000 and 7,000. Of the larger group, 3,307 derived some—but less than 50%—of their income from salaries; and 1,706 of the smaller group derived more than 50% but less than 100% from salaries. The sum of these two part-salaried groups equals 5,013. Hence the non-salaried numbered 19,906 (23,213 minus 3,307), the part-salaried, 5,013, and the all-salaried, 4,959 (6,665 minus 1,706).

crease in the incomes of all physicians was less than 186%. On the basis of limited data we would estimate that the mean net income of all physicians in 1949 ($11,058) was roughly 150 to 170% above that in 1935-1939 (between $4,100 and $4,400). The national income of the American people was 224% higher in 1949 than in the period 1935-1939; the national income per capita was 179% higher. The increase in the national income when adjusted for the number of persons in the working force—commonly called the number gainfully employed—was 177%. (Some economists might prefer the smaller national aggregate known as personal income as a frame of reference; personal income per capita in 1949 was 159% higher than in 1935-1939.) It appears quite clear that the rise in the incomes of physicians and of the American people—their patients—have kept pace with each other during the 1940's. The average physician has been traveling near the center of the inflationary highway up which the entire American economy has been moving since before World War II. Such is the over-all picture presented by the current survey of physicians' incomes in relation to the general level of income of the American people. Whether physicians' incomes were too high or too low in 1935-1939 has not been determined and, possibly, never will be determined to the complete satisfaction of all people. How much was "too high" or "too low" in 1935-1939? An answer would require almost endless consideration of the alternative economic opportunities of high school graduates of equal talents, the personal and economic sacrifices during 8 to 13 years of premedical and medical education and training, the long work week of practitioners, the economic equivalent of the personal satisfaction of helping restore sick people to health. These considerations are largely beyond the scope of our present interest.

The most comprehensive previous study of the incomes of physicians was by Leven for 1929.[3] Accordingly, Weinfeld chose to use 1929 in most cases as his base year despite the fact that economists generally consider 1929 "over the hill and far away" for any purposes of historical comparisons. To our knowledge, no agency of the Federal Government is currently using 1929 as a base period in its economic reports. The available data on physicians' incomes for 1929 are, however, of bench-mark stature; they are far superior to the data available for 1935-1939, particularly with regard to specialists. This situation presented the Office of Business Economics with a difficult choice. A reasonable compromise would have been for Weinfeld to use 1929 for internal comparisons between classes of physicians and 1935-1939 for comparisons between the incomes of physicians and the American people—their patients. The general picture, however, is about the same if 1929 instead of the customary 1935-1939 is used as the base period. The mean net income of all civilian physicians increased by 108%, from $5,304 in 1929 to $11,058 in 1949; the increase for all earners in the general population was 109%.

According to the U. S. Bureau of Labor Statistics, the fees of physicians were 38% higher in 1949 than in the base period 1935-1939.[4] This index of physicians' fees is part of the Consumers' Price Index—formerly known as the Cost of Living Index—which is so widely used in making wage adjustments. The entire index for 1949 was 69% above the base period.

Obviously, an increase of 150% or 160% or 170% in the average incomes of physicians since the base period cannot be attributed to a general rise in fees alone. Two other factors, which we believe are probably more important in accounting for this increase in physicians' incomes, are: (1) improved collections—a decrease in the percentage of uncollected bills for medical services rendered and, perhaps, a smaller percentage of charity patients to whom services were given free or at reduced fees; (2) greater "output per physician." These data on the incomes of physicians clearly indicate that 1,000 physicians were doing considerably more medical work in 1949 than 1,000 physicians did a dozen years ago. This increase in "output per physician" resulted from, among other things, changes in therapy and diagnosis, increased use of technical assistants, seeing a higher proportion of patients in the office and in the hospital, and improved transportation.

TABLE A.—*Average Gross Income and Net Income of Physicians by Source of Income, 1949*

Group of Physicians [1] and Number *of Replies Analyzed*	Mean Net Income (1)	Median Net Income (2)	Mean Gross Income (3)	Median Gross Income (4)	Percentage of Replies (5)
1. "All" Physicians (29,878)	$11,058	$8,835	$18,316*	$14,829*	100.0%
2. Independent Physicians (23,213)	11,858	9,668	......	......	77.7
2a. General Practice	8,835	7,428	......	......	(32.1)
2b. Partly Specialized	11,758	9,902	......	......	(14.1)
2c. Fully Specialized	15,014	12,599	......	......	(31.5)
3. Salaried Physicians (6,665)	8,272	7,555	......	......	22.3
3a. General Practice	6,281	6,132*	......	......	(2.8)
3b. Partly Specialized	7,135	6,693	......	......	(2.2)
3c. Fully Specialized	8,884	7,953	......	......	(14.4)
3d. Other	8,351	7,890*	......	......	(2.9)
4. Non-Salaried Physicians (19,906)	11,744	9,561	19,710	16,108	66.6
5. Part-Salaried Physicians (5,013)	10,928	8,760	12,781	8,993	16.8
6. All-Salaried Physicians (4,959)	8,434	7,678	......	......	16.6

Source: Weinfeld, William: "Income of Physicians, 1929-49," **Survey of Current Business**, July, 1951, U. S. Department of Commerce, Tables 2, 3, 6, 7, and 9.

* Hitherto unpublished data from the joint Department of Commerce/American Medical Association 1950 income survey of the medical profession. These data were eliminated from the Weinfeld article because of lack of space. We have also quoted a few figures in the text which were deleted from Weinfeld's tables in the final editing.

1. The group "all" physicians (row 1), including salaried as well as independent practitioners, excludes interns, residents, fellows-in-training, physicians in military service, and medical school personnel. All replies (row 1) were classified into two groups (rows 2 and 3) and then reclassified into three groups (rows 4, 5, and 6). Independent physicians (row 2), that is, physicians in independent practice, are those whose major source (more than 50 per cent) of medical income is fees from independent practice; they include (*a*) all non-salaried physicians (row 4) and (*b*) those of the part-salaried (row 5) whose major source of income is fees from independent practice. Salaried physicians (row 3), that is, physicians in salaried practice, are those whose major source of medical income is from salaried practice; they include (*a*) all of the all-salaried physicians (row 6) and (*b*) those of the part-salaried physicians (row 5) whose major source of income is from salaried practice.

REACTIONS OF PHYSICIANS

Doubtlessly, the reactions of physicians to the average incomes given in this summary and to the many more given in in the article in the *Survey of Current Business* will vary considerably. Physicians who were practicing in 1935-1939 and who are now approaching the peak earning period of their lives, around age 50, will probably contend that these reported over-all averages ($11,058 and $8,835) are too low. On the opposite side will be physicians who were in their fifties a dozen years ago and are now well past the peak earning period of life; their incomes have increased, on the average, far less than 150% to 170% since 1935-1939. On the whole, physicians who are now at or near the peak earning period of their lives will regard the averages as too low and older physicians will probably think they are too high. Likewise, many specialists will regard the over-all averages as too low and many general practitioners will consider them too high. Such are the limitations of any over-all average. The averages for each of the various groups of physicians will probably seem more reasonable to most physicians in each group. In thinking about the rise in their own incomes, many physicians will forget that the national income also rose until it was three and one-fourth times as great in 1949 as in 1935-1939. Only by comparing the increase in the incomes of the members of their profession with that of the American people taken all together can physicians get any real perspective on their relative position in a rapidly changing economy.

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[3] Leven, Maurice: The Incomes of Physicians, An Economic and Statistical Analysis, Publication No. 24, The Committee on the Costs of Medical Care, Chicago, The University of Chicago Press, 1932.

[4] Dickinson, F. G.: Medical Care Prices Vs. Cost of Living, J. A. M. A. **143**: 1198-1199 (July 29) 1950. Reprinted as Bulletin 76, Bureau of Medical Economic Research, American Medical Association, Chicago, 1950. In addition to fees and net incomes, other factors should be considered by a physician in estimating his slice of prosperity. They, like other citizens, are inclined to ignore their share of the increasing liability of citizens for the national debt in estimating their net worth. Bulletin 65, "How Rich Are You?" (Bureau of Medical Economic Research, American Medical Association, 1948), describes a method by which physicians and others can estimate their family's share of the burden of the federal debt.

The concept of the average income of the members of a clearly defined group is useful in making historical comparisons. On the other hand, the concept of the income of the average member of that group is very misleading because no person can remain at the same age as time passes. Two illustrations, based on Weinfeld's Table 16, can be used to show that the concept of the average physician must be used very carefully by any physician who seeks to check the changes in his own income during the past 20 years with the averages developed in this and earlier surveys of the incomes of physicians by the U. S. Department of Commerce.

Consider a physician who was just under 30 years of age in 1929 and hence almost 50 years of age in 1949. The average net income of physicians in independent practice in the age group 45-49 in 1949 was somewhat more than twice as great as the average of those in the under-age 30 group. If we assume that this age-earnings relationship has held true since 1929, this physician could have expected his net income for 1949 to have been about twice as great as his net income in 1929 providing he had enjoyed the average gain due to 20 years of experience in the practice of medicine. His income would not have kept pace with the average of his medical school classmates if it had not doubled between 1929 and 1949. In addition to the age-earnings progression of his profession, there is a second factor which should have increased his income—the general increase in the average income of the American people which, on the average, doubled between 1929 and 1949. As already noted the average income of physicians also doubled. (If the average income of all physicians—and of the American people—had remained unchanged, this second factor could, of course, be ignored in our illustration.) On the basis of these two factors combined, the income of this physician should have quadrupled between 1929 and 1949 ($2 \times 2 = 4$).

Now consider a physician who was in his late forties in 1929. In his age-earnings progression Weinfeld groups all physicians 65 and over into one class. On the basis of this age-earnings progression we can assume that the average physician's income at age 67 is about half as high as the average for age 47. This second physician, who at age 47 in 1929 was at or near the peak earning period of his life, should have earned one-half as much in 1949 as he did in 1929 under the assumptions regarding the age-earnings progression already noted above. During those 20 years, however, the average incomes of the American people and of all physicians doubled. Hence, these two factors cancel out, indicating no difference between his 1929 and his 1949 income ($\frac{1}{2} \times 2 = 1$).

These two illustrations were chosen as extreme cases in order to show the differences between physicians who were at their peak earning period of life in 1949 and in 1929. Any particular physician who attempts to use this new survey of physicians' incomes as a means of determining whether his income was above or below average in 1949 should separate these two economic factors in making any computation for himself. He should examine Weinfeld's tables 8, 16, and 18 which show the averages by age groups. Unfortunately only a few comparable averages by age groups for 1929 were developed by Leven[5] and none are available for 1935-1939. If such averages were available by age groups, a physician at any age could easily determine how near his 1929, 1935-1939, and 1949 net incomes were to the average for his attained age group in each of these years.

AVERAGE GROSS INCOMES

The gross income corresponding with $11,058, the average net income of all physicians, was $18,316; thus, the net was 60.4% of the gross. The relationship between the net and gross incomes of non-salaried physicians is probably more significant; the net was $11,744, 59.6% of the gross, $19,710. Weinfeld notes a slight rise in the general cost of conducting a medical practice, from 36.7% of gross in 1945 to 40.4% in 1949. Payroll expense alone rose from 11.1% to 13.2%. The remainder of the 40.4% in 1949 was paid to business firms for drugs and supplies and for such other items as transportation (automobile, train) and rent. More generally, the average physician realizes about three-fifths of the fees paid to him by his patients and the other two-fifths is paid out by him to other income receivers. Hence, our principal interest in this summary, as well as in the article itself, is in net income and not in gross income. Some day we hope to make a survey of the personal consumer expenditure patterns of physicians. We suspect that the percentages spent for homes and automobiles are high and the percentages spent for other items, e. g., tobacco and recreation, are low relative to the expenditure patterns of all families in the same income class. This peculiar pattern may reflect the long work week of the physician.

INCOMES OF LAWYERS AND DENTISTS

The mean net income of non-salaried lawyers rose from $5,534 in 1929 and $4,363 in 1935-1939 to $8,083 in 1948, increases of 46% and 85%, as compared with the increases of 125% and 186% for non-salaried physicians.[6] The present survey is the first which clearly indicates that the average incomes of physicians are now above those of lawyers. Studies covering the late 1920's and early 1930's placed the lawyers' incomes above the physicians'. The mean net income of non-salaried dentists rose from $4,267 in 1929 and $2,812 in 1935-1939 to $7,146 in 1948, increases of 67% and 154%.[7] Apparently there has been no counterpart in the practice of law or dentistry of the so-called wonder-drug revolution of the last decade and a half in the practice of medicine. Rapid changes in diagnosis and therapy have unquestionably increased very sharply the demand for the services of physicians.

The expected data on the average hours of work per week for physicians, required for the comparisons of income per hour, are not now available. Hence, no comparisons of hours worked and of earnings per hour in these three professions can be presented. The comparisons of these incomes of physicians, lawyers, and dentists are of some significance today but much more significant comparisons of the major professions can be made after future surveys of the incomes of certified public accountants and consulting engineers have been made; these two professional groups outranked physicians and lawyers in earlier studies of the incomes of these five major professional groups.[7]

Our major interest in this summary of the article is the relationship between the trends in the incomes of physicians and of the American people—their patients. For several reasons Weinfeld has a greater interest in comparing the incomes of the different professions; these reasons are closely related to the particular function of his studies for the Office of Business Economics. Although the study has been clarified by the exclusion of interns, residents, and fellows-in-training, we believe that these physicians should be included when comparing the over-all average incomes of physicians with those of lawyers and dentists because the latter two professions do not have any comparable group which could be excluded from surveys. These physicians, under the supervision of senior physicians in hospitals, are providing a very large amount of medical care to the American people. Their monthly salaries are nominal. As noted by Weinfeld, if they had been included in the survey the average net income of all physicians would have been perhaps 10% lower, say about $10,000 instead of $11,000. It is especially *necessary to make this allowance in comparing the three professions* because young lawyers and young dentists were included in the surveys of incomes of lawyers and dentists. At least the comparisons should have been age for age. We wish to make it clear, however, that for all other purposes we thought that the decision to exclude interns, residents, and fellows-in-training was proper.

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[5] Op. cit. p. 114. He presented average gross incomes by years of practice instead of by age groups.

[6] Weinfeld, William: Income of Lawyers, 1929-1948, Survey of Current Business, (Aug.) 1949, U. S. Department of Commerce.

[7] Weinfeld, William: Income of Dentists, 1929-1948, Survey of Current Business, (Jan.) 1950, U. S. Department of Commerce, pp. 8-16. For earlier comparisons of the incomes of these five professions, see Friedman, M., and Kuznets, S.: Income from Independent Professional Practice, New York, National Bureau of Economic Research, 1945.

INCOME AFTER TAXES

Net incomes before and after federal taxes are two quite different amounts. The increase since 1935-1939 in mean net incomes overstates the gain in mean net incomes after federal income taxes. Because physicians, like other citizens, are required to pay federal income taxes, it is proper to mention the peculiar economic pattern of the life of the physician. After spending a long time in training, any professional man starts to earn late in life and his lifetime earnings are bunched into a relatively short period of time. Because income tax rates are steeply progressive he will pay more taxes during his lifetime than another person who earns exactly the same amount of money during his life, spread over a longer working lifetime—as much as 10 years longer than the working lifetime of the typical physician. Because of the lack of precise data for the base period, 1935-1939, we can make only general comments about the probable increase in the mean net income after taxes. We have, however, estimated that, assuming a wife and two other dependents, the amount of income taxes on 1949 incomes averaged about $1,300 per physician as compared with less than $100 of taxes in the base period, 1935-1939. It should be abundantly clear that the increase in the net income after taxes between 1935-1939 (and 1929) and 1949 was far less than the increase reported in the article for mean net incomes before taxes.

THE ALL-SALARIED VERSUS THE NON-SALARIED

As previously noted, the mean net income for 1949 of physicians who derived all of their professional income from salaried practice — the all-salaried physicians — was $8,434 as compared with the mean of $11,744 for those in non-salaried practice. *The difference of $3,310, uncorrected for age differences,* must be examined. The non-salaried physician is roughly comparable to a small retailer; as such, he is a prime risk-bearer in our economy. Accordingly, inflation and prosperity raise his income more sharply than the salary of the all-salaried physician; and vice versa in depression. The excess in the average number of hours worked per week by the non-salaried above the average worked by the all-salaried physicians is not now available. In addition to less exposure to the business cycle, the *all-salaried physicians have certain financial advantages* which are not reflected in their cash compensation. Among these are various provisions for vacations, sick leave, insurance, and, perhaps most important, pensions. The non-salaried physician, whether he is an individual proprietor or a partner, cannot use any of his gross income to purchase an annuity or pension for himself because he does not qualify under the employer-employee relationship defined in the Federal Income Tax Law. On the other hand, the physician who is employed can have a pension financed in whole or in part by his employer out of his employer's gross receipts. This pension benefit does become taxable to the all-salaried physician when he retires; the extra benefit is merely a tax deferment which will enable him to pay the tax on this benefit during his retired years when, presumably, the income tax rate will be lower for him because his income is lower. It is impossible, however, to assign a specific amount of the $3,310 difference to this pension advantage[8]; our best guess would be one-fourth. Vacation pay and sick leave benefits could account for a similar fraction of this difference of $3,310.

TABLE B.—*Average Net Income of Physicians by Region, 1949*

Region	Physicians in Independent Practice		Physicians in Salaried Practice		Non-Salaried Physicians	
	Mean (1)	Median (2)	Mean (3)	Median (4)	Mean (5)	Median (6)
1. New England	$ 9,740	$ 8,061	$8,605	$7,597	$ 9,602	$ 7,816*
2. Middle East	10,270	8,263	8,026	7,562	10,130	8,157*
3. Southeast	12,157	9,855	7,616	7,333	11,958	9,602*
4. Southwest	13,243	11,402	8,604	7,545	13,179	11,320*
5. Central	12,755	10,743	9,115	7,879	12,631	10,674*
6. Northwest	12,313	10,632	7,808	7,283	12,305	10,678*
7. Far West	14,368	12,178	7,807	7,409	14,235	12,243*
8. United States	11,858	9,668	8,272	7,555	11,744	9,561

Source: Weinfeld, Tables 10 and 12.

* See footnote (*) to Table A.

The states included in each of the seven regions are **New England:** Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont; **Middle East:** Delaware, District of Columbia, Maryland, New Jersey, New York, Pennsylvania, West Virginia; **Southeast:** Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia; **Southwest:** Arizona, New Mexico, Oklahoma, Texas; **Central:** Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, Wisconsin; **Northwest:** Colorado, Idaho, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah, Wyoming; **Far West:** California, Nevada, Oregon, Washington.

SPECIALISTS VERSUS GENERAL PRACTITIONERS

The reported mean net income of general practitioners in independent practice for 1949 was $8,835, for partly specialized (part-time specialists), $11,758 and for fully specialized (full-time specialists), $15,014. Thus the mean net income of the partly specialized physicians was almost the same as the mean net income of all physicians in independent practice (physicians whose major source of income was fees)—$11,858, as already noted; in that sense, he is an average physician. The spread of about $6,200 between the averages for general practitioners and fully specialized physicians will be of great interest to all members of the medical profession. Weinfeld notes that the spread was considerably smaller percentagewise in 1949 than in 1929 and only $100 more. This important finding is also presented in one of his charts.

Elsewhere[9] we have estimated that the accumulated investment of an intern in his seven or eight years of premedical and medical education and in income sacrificed is well over $30,000. The intern contemplating the three or four years of residency training necessary to become a specialist must reckon with the economic aspects of an additional investment. The income margin between specialists and general practitioners may or may not have a dollar value sufficient to offset the extra financial sacrifice during three or four years of additional training at nominal salary, or the personal sacrifice at a time in life when most young men are starting or have already started to have a family. Furthermore, *the tendency of specialists to locate in* the larger cities where family living costs are higher may offset some of the extra earnings of specialists. Professional qualifications, interests, and prospects may outweigh these economic considerations in the decision to become or not to become a specialist. We shall defer comment until we know the differences in the age distribution of general practitioners and fully specialized physicians which could account for some of the difference in the mean net incomes.

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[8] Under the leadership of a special committee of the American Bar Association, a bill (H.R. 4371) was introduced recently in Congress for the purpose of correcting this tax inequity for all self-employed. This inequity is especially great in the professions because of the long period of training and subsequent relatively high incomes—and physicians have a much longer training period than other professional men.

[9] Dickinson, F. G.: Income Tax Discrimination Against the Professions, J. A. M. A. **142**: 1357-1360 (April 29) 1950. Reprinted as Bulletin 74, Bureau of Medical Economic Research, American Medical Association, Chicago, 1950.

REGIONAL VARIATIONS

We turn now to certain important breakdowns of the quantity of data presented in this current article. As already noted, the mean net income of non-salaried physicians in 1949 was $11,744 and the median, $9,561. The regional differences are shown in Table B for physicians whose major source of income was fees from independent practice, for physicians whose major source of income was from salaried practice, and for physicians whose entire source was from independent practice (non-salaried physicians). The non-salaried physicians in the Far West (Washington, Oregon, Nevada, and California) reported the highest mean and median net incomes, $14,235 and $12,243. New England ranked lowest in both mean and median incomes, $9,602 and $7,818. We are now dealing with a part of the universe of our responses and many questions can be raised regarding the representativeness of the returns from each of these seven regions. Weinfeld tested each area by median age and found no striking incongruities.

Unfortunately, the Bureau of Medical Economic Research was not able, at the appointed time, to provide the Office of Business Economics with the data on age breakdowns necessary to eliminate that factor through the customary statistical procedure of age standardization. For this reason our criticism and skepticism regarding regional and other breakdowns of the data should not be considered a reflection on the Office of Business Economics and Mr. Weinfeld, but a confession of our own inability to provide the assistance which we had hoped we would be able to give at the time needed. We expect later to make many of these corrections for variations in age which could, of course, account for some of the regional differences between the mean and median net incomes in New England and the Far West. On the other hand, the rate of population and economic growth of an area has a great deal to do with the average earnings of physicians and of most income earners.

TABLE C.—*Average Net Income of Physicians by Size of Community, 1949*

Size of Community (Population)	"All" Physicians Mean (1)	"All" Physicians Median (2)	Physicians in Independent Practice Mean (3)	Physicians in Independent Practice Median (4)	Physicians in Salaried Practice Mean (5)	Physicians in Salaried Practice Median (6)	Non-Salaried Physicians Mean (7)	Non-Salaried Physicians Median (8)
1. Under 1,000	$ 7,090	$ 6,177	$ 7,109	$ 5,699	$7,019	$7,000	$ 7,029	$ 5,606*
2. 1,000-2,499	8,579	7,547	8,732	7,667	7,388	6,800	8,775	7,748*
3. 2,500-4,999	10,593	9,050	11,228	10,110	7,361	7,446	11,297	10,088*
4. 5,000-9,999	11,028	9,354	11,624	10,149	8,486	7,452	11,581	10,069*
5. 10,000-24,999	11,425	9,667	12,134	10,621	8,462	7,610	12,282	10,712*
6. 25,000-49,999	11,876	9,759	12,812	11,037	9,157	7,932	12,903	11,274*
7. 50,000-99,999	12,155	9,793	13,186	10,921	8,578	7,878	12,991	10,679*
8. 100,000-249,999	12,062	9,537	13,110	10,690	8,366	7,620	13,083	10,629*
9. 250,000-499,999	12,766	10,195	14,276	11,970	7,803	7,358	14,368	12,084*
10. 500,000-999,999	11,885	9,463	13,161	10,546	8,736	7,925	12,877	10,325*
11. 1,000,000 and over	10,021	7,712	10,661	7,988	7,946	7,199	10,287	7,754*
12. United States	11,058	8,835	11,858	9,668	8,272	7,555	11,744	9,561

Source: Weinfeld, Tables 10, 14 and 15.

* See footnote (*) to Table A.

Weinfeld also presents tables showing mean and median net incomes for individual states. For physicians in independent practice the three highest means were for Arizona, Washington, and California; the three lowest, for Vermont, Maine, and Arkansas. For physicians in salaried practice the three highest means were for Minnesota, North Dakota, and New Hampshire; the three lowest, for Nevada, Nebraska, and Kentucky. Since it was not possible for Weinfeld to make more than general tests of the representativeness of the returns from each state, we shall withhold comment on these state differences and rankings until we have had an opportunity to check the data against our punch card file for physicians, which is nearing completion. For the same reason we shall withhold comment on Weinfeld's table of estimates, by states, of personal consumer expenditures for physicians' services. Although there has been considerable demand for these state breakdowns on personal consumer expenditures, we are somewhat skeptical about the validity of the differences between states and of the absolute amounts.

NAMED CITIES

Data on net incomes were computed for 32 named cities of more than 325,000 population. The highest mean net income for all physicians, $14,817, was reported for Memphis. Memphis also ranked first with $18,758 in the mean net incomes, by cities, of physicians in independent practice. In the first group Minneapolis ranked second, and Atlanta ranked second in the second group. The complete city rankings may be obtained from the article itself. We have serious doubts about the "representativeness"—in a generic sense— of the returns from these named cities despite the large number (30,000) of replies from the entire country and the statistical tests made by Weinfeld. More than he, we doubt that the information is sufficiently broad to warrant a statement that the mean or median net income in any category was higher in Memphis than in Atlanta or Minneapolis. Perhaps in our subsequent study of these returns we shall find reasons for more confidence in the averages for named cities.

BY SIZE OF CITY

Weinfeld classified cities into 11 sizes according to population; the smallest group was cities of less than 1,000 population and the top group, cities of 1,000,000 and over. City size variations in the cost of living are, of course, outside the scope of this study. It would seem a priori that the averages by size of city for the larger categories of physicians are probably more reliable than for some of the smaller categories and far more reliable than for named cities. A summary of Weinfeld's data on city size is presented in tables C and D. The highest mean net income for all physicians ($11,058 for the U. S.) was reported for cities of 250 to 500 thousand; the highest median income ($8,835 for the U. S.) was also reported for cities of 250 to 500 thousand—see row 12, columns 1 and 2 of Table C. For physicians whose major source of income was fees from independent practice (columns 3 and 4), the highest mean and median net incomes were reported for cities of 250 to 500 thousand; and the highest mean and median net incomes for physicians whose major source of income was salaried practice, cities of 25 to 50 thousand. For physicians whose entire source of income was from independent practice the highest mean and median net incomes were reported for cities of 250 to 500 thousand. For physicians in independent general practice (row 1a, Table D) the highest mean and median net incomes were reported for cities of 5 to 10 thousand (where the costs of living are usually relatively low); for partly-specialized (row 1b), cities of 10 to 25 thousand; and for fully-specialized, cities of 250 to 500 thousand. For physicians in salaried general practice the highest mean and median net incomes were reported for cities of 2.5 to 5 thousand; for partly-specialized, 1 to 2.5 thousand; for fully-specialized, 25 to 50 thousand; and for "Other" (mostly medical administrators), the highest mean net income was reported for cities of 1 million and over and the highest median net income for cities of 500 thousand to 1 million.

The small size of the samples casts some shadow of doubt upon some of these city size conclusions, especially those for physicians included under "Other." All physicians, particularly interns and residents contemplating a choice of location, will note this clear evidence from the city size data of the higher average net incomes (in dollars) for general practitioners in the smaller cities, for partly-specialized in the somewhat larger cities and for fully-specialized in cities of 250 to 500 thousand and that in no single instance (except for the physicians in the "Other" classification) is the highest mean or median net income reported for cities of 500 thousand and over or for towns of under 1 thousand. Other studies of physicians' incomes have noted the same feature of the returns from the very large cities. Although the representativeness of the samples is not perfect, it appears reasonably certain that the extremely large cities are over-supplied with physicians who might do better for themselves if they were located in other places where living costs may be lower. This conclusion is further supported by observations of numerous physicians who are in a position to give informed opinions. Weinfeld notes that the increases in 1949 over 1929 were greatest for cities under 5,000 and smallest for cities over 1,000,000. We sincerely hope that this survey of physicians' incomes will help in moving some of the physicians out of the extremely large cities. We fully appreciate the incompleteness of averages; some of the attractiveness of a metropolitan practice comes from the conviction of a physician making a choice of location that he will rise far above the average. On the other hand, rapid and extensive improvements in transportation have brought many of the small towns well within the economic and social orbits of the nearby cities, large and small. Income in 1949 per person engaged in agriculture (including forestry and fishing) had risen 253% since 1935-1939. Dollars of net income do not reveal the lower family living costs and the subjective appeals of a rural medical practice.

TABLE D.—*Size of City (Population in Thousands) with High and Low Average Net Income, by Degree of Specialization*

	High Mean Net Income		Low Mean Net Income		High Median Net Income		Low Median Net Income	
	Amount (1)	City Size (2)	Amount (3)	City Size (4)	Amount (5)	City Size (6)	Amount (7)	City Size (8)
1. Physicians in Independent Practice	$14,276	250-500	$7,109	Under 1	$11,970	250-500	$5,699	Under 1
1a. General Practice..............	10,586	5-10	6,596	Under 1	9,336	5-10	5,455	Under 1
1b. Partly Specialized.............	14,302	10-25	8,401	1,000 and over†	12,871	10-25	6,694	1,000 and over†
1c. Fully Specialized..............	16,608	250-500	11,885	1-2.5	14,210	250-500	8,000	1-2.5
2. Physicians in Salaried Practice....	9,157	25-50	7,019	Under 1	7,932	25-50	6,800	1-2.5
2a. General Practice..............	7,000	2.5-5	5,700	250-500	7,143*	2.5-5*	5,577*	1,000 and over*†
2b. Partly Specialized..............	9,000	1-2.5	6,255	1,000 and over†	8,000*	1-2.5*	6,114*	1,000 and over*†
2c. Fully Specialized..............	10,028	25-50	7,288	Under 1	8,625*	25-50*	7,329*	Under 1*
2d. Other	9,068	1,000 and over†	6,197	5-10	8,571*	500-1,000*	5,750*	5-10*
3. "All" Physicians...................	12,766	250-500	7,090	Under 1	10,195	250-500	6,177	Under 1

Source: Weinfeld, Tables 7, 9, 14 and 15.

* See footnote (*) to Table A.

† 1,000 and over means, of course, 1,000,000 and over.

WHICH SPECIALTY?

There will be considerable interest in the tables showing average net incomes for fully-specialized physicians by specialty. For the full specialists in independent practice, neurological surgery ranked first with a mean net income of $28,628 and a median net income of $24,500. Pathology ranked second with a mean of $22,284 and a median of $20,167. The median incomes are not influenced by the extremely large or the extremely small incomes reported by a few physicians. The rankings of specialty groups by medians is probably more reliable than by means; the two rankings, however, do agree for neurological surgery and pathology. The median ages of the respondents were 42 and 49 years, respectively. We are still in the process of developing age breakdowns which will enable us to make additional tests of the age representativeness of the returns from these specialists; this difference of seven years in the median ages of these two specialty groups seems, on the surface, excessive although pathology is one of the older specialties and neurological surgery is one of the newest. Weinfeld notes that the highest mean and median net incomes are reported for the specialties having very few members. Pathology also ranks second for the salaried full specialists with mean and median net incomes of $11,745 and $10,957, but roentgenology-radiology ranks first with $12,326 and $10,412. Again the author provides only the median age of those reporting, 41 years for pathology and 40 years for roentgenology-radiology. So much detail on the specialties is presented in the article that only this cursory summary of the highlights could be presented here.

FINAL COMMENTS

Our appreciation of the indebtedness of physicians and medical economists to the author, William Weinfeld, and to M. Joseph Meehan, Director of the Office of Business Economics, and the difficulties under which they have worked is so keen—among which has been our own inability to furnish them with certain data required for testing the representativeness of their many samples—that we would not at this time care to present many additional analytical comments. For many years to come their tabulations and interpretations of the returns from this survey will stand out as a basic reference point in future studies of physicians' incomes. Frankly, we were surprised that the maximum incomes were reported for ages 40-44 or 45-49 in most of the classifications for we had expected the peak earnings to be found later in life. Higher incomes of partners may be due to specialty, size of city, and age factors; partnerships and group practice are not synonymous terms even for partnerships of three or more members. But, as previously noted, we were unable to furnish the data necessary to eliminate the age factor as a variable. This is the outstanding defect of the study. The large sample (30,000) may actually make this prime defect of lesser importance than it now seems to us. Ideally, data for standardized age blocks should have been developed before the computation of over-all means and medians. Weinfeld also notes the over-response—a higher than expected percentage of replies—from specialists and, in the "Technical Notes," the over-response and under-response from certain states. He has made corrections for the latter, which produced negligible changes in the averages, but none for the former. There are also some indications of an over-response from salaried physicians.

The significance of this survey will probably change as time passes. At the present writing it seems to us that the important implications of this study are as follows:

1. The rise in physicians' incomes of the past dozen or 20 years has been at about the same rate as the rise in the national income per capita. More generally, the American people have been fair to their physicians in an inflationary era from the standpoint of income; and vice versa.

2. Talented high school graduates will continue to choose medicine for the age-old reasons—a great interest in the natural sciences and a conviction that a medical career will provide an opportunity to serve people. The inflationary 1940's have produced only one new financial reason for choosing medicine, namely, that medicine now pays better, on the average, than law—for the incomes of lawyers have not kept pace with the inflationary trends as have physicians' incomes. The trends

for certified public accountants and consulting engineers will doubtlessly be described in future surveys.

3. The highest 1949 average net incomes were not received by physicians in the larger cities where family living costs are high.

4. The differences between the average incomes of the all-salaried and the non-salaried physicians are considerable, but the value of the perquisites of the all-salaried physicians must be weighed.

5. The moderate increase in physicians' fees since 1935-1939, as reported by the United States Bureau of Labor Statistics, was only one of the three major factors responsible for the increase in the average incomes of physicians which has enabled physicians' incomes to keep pace with the inflationary trend of the 1940's. The other two major factors were the improved collections of fees and the increased "output per physician."

6. In addition to these three specific factors, the increase in the number of physicians since the base period must be considered. If there had been the nationwide shortage of physicians in 1949 which some writers have alleged, it is almost certain that physicians' incomes would have been, on the average, far higher and the increases in recent years far greater. This survey of physicians' incomes has revealed no general economic evidence of a national shortage of physicians.

BUREAU OF LEGAL MEDICINE AND LEGISLATION

MEDICOLEGAL ABSTRACTS

Malpractice: Failure to Use Roentgenograms to Locate Needle in Eye.—The plaintiff sued for damages allegedly caused by the negligence of the defendant physician. From an order dismissing the action, the plaintiff appealed to the Supreme Court of Washington.

In the performance of an operation upon one of the eyes of the plaintiff, the defendant physician inserted a number of minute metallic needles, each one of which had been threaded with black silk. When the operation was finished the needles were removed, but the defendant discovered that one of them was missing. There was one thread more than the number of removed needles. The defendant endeavored to locate the missing needle in the eye, but was unable to find it. No use was made of an x-ray to aid in discovering the needle. About eleven days after the operation, the defendant by use of x-ray equipment located the needle in the eye and removed it, but the plaintiff lost the use of that eye.

The Supreme Court said that when it was made to appear that the needle had been left in the plaintiff's eye, and that by the use of the x-ray its presence and location later became known, the jury would have had the right to infer that if the x-ray had been used before the operation was closed the presence of the needle would have been discovered and could have been removed. It may be, the court continued, that the condition of the eye was such that the presence of the needle would not have been discovered by the x-ray at the close of the operation, or there were other sufficient reasons why proper surgical practice justified omission of the use of x-ray at that particular time, but the burden was upon the defendant to go forward and submit evidence upon such questions. It was the duty of the defendant, when he either knew or had good reason to believe that the missing needle was or might be in the eye, to use available methods known to his profession to locate the missing needle. On the basis of this evidence, said the Supreme Court, the trial court should not have sustained the challenge to the sufficiency of the evidence. Accordingly the judgment in favor of the defendant physician was reversed and the cause was remanded for a new trial.—*Madis v. Stellwagen et ux, 227 P. (2d) 445 (Washington, 1951).*

MEDICAL MOTION PICTURES

Palmour Street; A Study in Family Life: 16 mm., black and white, sound, showing time 29 min. Produced in 1950 for Georgia State Department of Health by Southern Educational Film Production Service, Athens, Ga. Procurable on purchase ($50) from Health Publications Institute, Inc., Raleigh, N. C.

Basic concepts of mental health as they relate to family life are presented. The daily life of the Negro families living on Palmour St., Gainesville, Ga., serve to illustrate some of the ways in which parents influence the mental and emotional development of their children. Although the concepts are presented against the background of a Negro community, the same problems and situations apply in all homes. The demonstrations of both the mother's and father's love and the natural and real reactions of all the cast enhance the value of the film. It would stimulate a good discussion of family life.

This film is especially recommended for use with Negro church, parent-teacher, and other family groups. In selected instances it would also prove valuable for use with other adult groups. The photography, direction, and sound, are excellent.

Circulation: 16 mm., black and white or color, sound, showing time 16 min. Produced in 1950 by and procurable on purchase (black and white $75, color $150) from United World Films, 1445 Park Ave., New York.

This motion picture presents the elementary aspects of the anatomy and physiology of the circulatory system. The functions of the heart, veins, and capillaries and their general relation are shown by animated diagrams and by more detailed methods. A final sequence shows the making of a sphygmogram from the radial artery of a boy, before and after exercise.

The anatomy and physiology taught are correct in every respect, although the subject of the capillaries is handled superficially and the lack of labeling of right and left causes confusion when parts of the heart are described. The film would be most useful at the 7th, 8th, and 9th grade levels, since the omission of psychological emphasis and aims limits its use with adult groups. The photography and sound are very good.

House of Mercy: 16 mm., black and white, sound, showing time 17 min. Presented by RKO Pathe, This Is America Series. Produced in 1950 by Jay Bonafield. Procurable on 10 year lease ($80) from McGraw Hill Book Co., Text-Film Dept., 330 West 42nd St., New York 18, or on rental from Ideal Pictures Corp., 58 E. South Water St., Chicago 1.

This motion picture presents excellent general information about hospitals by the portrayal of a father who pays his first visit to the community hospital when he is notified that his son has been injured. After learning that his son is receiving expert attention, he makes a tour of various departments and discovers how scientifically and efficiently the members of the staff carry out their work. This man's enforced visit causes him to reflect on the importance of the hospital to the community.

The film is very informative, and the material presented is essentially accurate; however, it is lacking in motivation. It is recommended for all adult audiences and is especially useful for drives aimed at soliciting support for the establishment of community hospitals. The photography and sound are good.

Modest Miracle: 16 mm., black and white, sound, showing time 22 min. Produced in 1942 for Standard Brands, Inc., by Wilding Pictures Corp., Chicago. Procurable on loan from The Fleischmann Division, Standard Brands, Inc., 595 Madison Ave., New York.

Through a conference among a school principal, an undernourished grade school boy, and his father, the story of Dr. Robert R. Williams' isolation and synthesis of vitamin B_1 is portrayed. The enrichment of white bread with vitamin B_1 is also covered. The message of this film is fundamentally sound and interestingly told. However, the idea of having a school principal directly inform a pupil that he is undernourished is not to be considered as recommended practice. The implication that there was a large incidence of draftee rejection due to malnutrition in World War II may also be questioned.

If the above-mentioned portions of the film were corrected, it would be recommended for junior and senior high school students and adults. The photography and sound are excellent.

MEDICAL LITERATURE ABSTRACTS

AMERICAN

A.M.A. Arch. Internal Medicine, Chicago

87:627-774 (May) 1951

Cortisone and ACTH in Essential Hypertension: Establishment of Renal Glycosuria. H. Dustan, A. C. Corcoran, R. D. Taylor and I. H. Page.—p. 627.
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*Treatment of Ulcerative Colitis and Regional Enteritis with ACTH: Significance of Fecal Lysozyme. S. J. Gray, R. W. Reifenstein, J. A. Benson Jr. and J. C. G. Young.—p. 646.
Mortality Study in Bundle Branch Block. M. Rodstein, R. Gubner, J. P. Mills and others.—p. 663.
Relapsing Panniculitis (Weber-Christian Disease): Review of Literature and Report of Case Including Treatment with Cortisone. C. R. Shuman.—p. 669.
Clinical Aspects of Dietary Depletion of Riboflavin. O. W. Hills, E. Liebert, D. L. Steinberg and M. K. Horwitt.—p. 682.
Intermittent Bundle Branch Block of Long Duration: Vagal Influence on Intraventricular Conduction. G E. Hein and P. J. Sanazaro. —p. 694.
Desoxycorticosterone Acetate and Ascorbic Acid in Treatment of Rheumatoid Arthritis. D. S. Littman, R. H. Stockdale and G. R. Williamson.—p. 707.
Generalized Torulosis with Bone Involvement. M. F. Wiener.—p. 713.

Treatment of Ulcerative Colitis and Regional Enteritis with ACTH.—Corticotrophin (ACTH) was given in doses of 20 to 40 mg. intramuscularly at six-hour intervals for periods of four to eight weeks to six patients with severe, extensive ulcerative colitis and two with regional enteritis. A significant and often dramatic remission in the acute aspects of the disease was induced in all but one of the patients. The remission was characterized by a notable decrease in diarrhea, disappearance or diminution of blood in the stools, improvement of the appearance of the mucosa on sigmoidoscopic examination (the mucosa did not revert to normal in any instance), relief of abdominal pain and tenesmus, prompt fall in temperature, sedimentation rate and fecal lysozyme titer, and an increase in appetite and weight, accompanied with a sense of well-being. No clinical response was observed in one patient with chronic ulcerative colitis of 23 years' duration, extensive fibrosis and cicatrization of the colon, multiple strictures, and perianal and perineal fistulas. Relapses occurred in three patients with ulcerative colitis and in both patients with regional enteritis within three weeks to nine months after corticotrophin treatment was discontinued. The relapses were mild in all but one patient, and there was a good response to a second course of therapy. Long-term maintenance therapy or repeated courses of treatment may be indicated in some patients. In two of the five patients who responded to corticotrophin therapy remission has lasted up to 16 months. The fecal lysozyme titer was found to parallel the course and activity of ulcerative colitis, decreasing with remissions and increasing with exacerbations. The level of fecal lysozyme is a measure of the activity of the disease process and is a significant index of the available functioning tissue and its ability to respond to injury. The remission induced by corticotrophin may prove exceedingly helpful in the preparation of patients with ulcerative colitis for surgical treatment. The best long-term results were obtained in patients receiving a prolonged course of treatment. Administration of the hormone does not constitute a cure but is a valuable adjunct in the therapy of ulcerative colitis and regional enteritis, particularly in the early stages of these diseases.

A.M.A. Arch. Ophthalmology, Chicago

45:507-614 (May) 1951

Experimental Radiation Cataracts: I. Cataracts in Rabbit Following Single X-Ray Exposure. D. G. Cogan and D. D. Donaldson.—p. 508.
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Pathogenesis of Ophthalmoplegic Migraine. B. J. Alpers and H. E. Yaskin.—p. 555.

A.M.A. Arch. Pathology, Chicago

51:473-566 (May) 1951

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Id.: II. Kidneys of Patients with Different Pathologic Conditions, Especially Those with Lipoid Nephrosis. M. L. Menten and A. M. Carpenter. —p. 486.
Id.: III. Kidneys of Leukemic Patients. M. L. Menten and A. M. Carpenter.—p. 494.
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American Review of Tuberculosis, New York

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*Tuberculin-Negative Tuberculosis. W. Mascher.—p. 501.
*Cutaneous Inoculation Tuberculosis: Review of Literature and Report of Eight Cases. E. D. Grady.—p. 526.
*Studies on Communicability of Histoplasmosis. J. A. Prior and C. R. Cole.—p. 538.
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Chemotherapy of Tuberculosis: IV. Studies with Sulfones in Mouse. R. Donovick, J. Bernstein, C. McKee and G. Rake.—p. 556.
Enhancement of Growth of Dihydrostreptomycin-Resistant Strains of Tubercle Bacilli by Dihydrostreptomycin, Function of Initial pH Value of Medium. C. Hurwitz.—p. 568.

Tuberculin-Negative Tuberculosis.—Eleven patients with active tuberculosis and with negative cutaneous tuberculin reactions were observed. These patients were in good general condition and free from intercurrent nontuberculous infection. The presence of tuberculosis was established in six of the patients by the isolation of Mycobacterium tuberculosis from sputum culture. Acid-fast bacilli were seen on microscopic examination of the sputum in two patients, but tubercle bacilli were not isolated by culture. The bacteriologic examinations for tubercle bacilli were negative in the remaining three patients. Six of the patients were vaccinated with BCG; two became tuberculin reactors with a local papule after vaccination; one remained a tuberculin nonreactor but showed a possible "early reaction"; three showed no local reaction and remained nonreactors to tuberculin. Ustvedt's diagnostic tuberculin test resulted in no reaction in two other patients. In seven patients no reduction of normal skin sensitivity was demonstrated as judged by tests with codeine as a nonspecific irritant, the rate of absorption of a sodium chloride wheal, development of erythema after irradiation, and the incidence of passive dermographism. Some of the patients were examined for the presence of a tuberculin-neutralizing factor in the serum (so-called anticutin), which was found in one case

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Titles marked with an asterisk (*) are abstracted.

by tests in a guinea pig and in three human volunteers. Serum from another case appeared to contain "anticutins" when tested in three of the volunteers but not in another two persons. Sera from the remaining two patients were negative when tested in six human volunteers. The strain of M. tuberculosis (human type) isolated from one of the patients was studied in detail. A guinea pig became tuberculin-positive after inoculation with the strain. Vaccination of the patient's skin with the strain resulted in the development of cutaneous tuberculides without lymph node or general reactions as in tuberculin-positive tuberculous patients. Old tuberculin and purified protein derivatives prepared from the strain caused positive tuberculin reactions in controls of the same intensity as those developing by simultaneous testing with ordinary old tuberculin.

Cutaneous Inoculation Tuberculosis.—A comprehensive review of recorded treatments for cutaneous inoculation tuberculosis and eight recent case histories are presented. Persons who work with tuberculosis are always in danger of contracting the disease through skin inoculation. The review of the literature and two of the cases reported suggest that surgical excision of the tuberculous process usually results in a prompt cure. This treatment may shorten the course of the disease. If the cutaneous lesion and the involved lymph nodes are discrete and small, complete and immediate removal is the best method for cure. X-ray therapy has had general acceptance as a method of treatment per se and as an adjunct to other methods. It is, however, ineffective in caseous or abscessed glands. Streptomycin or other antituberculous drugs, either alone or in conjunction with surgery, are helpful in healing the disease. Incision and curettement of fluctuant nodes may be beneficial as a preliminary or final treatment of a particular disease area. Complete surgical excision of the skin lesions and of all other diseased tissue is the most rapid and satisfactory method for the treatment of patients with cutaneous inoculation tuberculosis.

Communicability of Histoplasmosis.—Prior and Cole made a pathological study of 12 dogs naturally infected with histoplasmosis to determine the various means by which Histoplasma capsulatum might be transmitted from dogs to other animals or human beings. Histoplasmosis developed in three of five dogs while they were exposed to eight dogs naturally infected with histoplasmosis. The three dogs gave negative reactions to the histoplasmin skin test before exposure to infected animals but showed histoplasmin reactivity within two to five months after exposure. No evidence of histoplasmosis was found in two dogs exposed to the animals with naturally occurring disease as well as to nine dogs with artificially induced histoplasmosis. Five dogs kept in a kennel with a dog found to have active histoplasmosis showed no evidence of the disease. In a group of 25 human household contacts of dogs with active histoplasmosis, there was no indication that any had the active disease. None of the eight laboratory workers showed evidence of active histoplasmosis after prolonged exposure to dogs with both naturally occurring and artificially induced histoplasmosis, although five had positive skin reactions. No evidence was found in this study suggesting the transmission of canine histoplasmosis to man, but its communicability from dog to dog was established. The dog should still be considered a potentially dangerous source of human histoplasmosis, because it has been demonstrated that the fungus can be disseminated via sputum, saliva or vomitus, feces, and urine.

American Surgeon, Atlanta, Ga.

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Argument for Radicalism in Cancer Surgery. G. T. Pack.—p. 271.
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Annals of Allergy, Minneapolis

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Annals of Internal Medicine, Lancaster, Pa.

34:849-1092 (April) 1951

Occurrence of Symptoms of Sickle Cell Disease in Absence of Persistent Anemia. T. W. Green and C. L. Conley.—p. 849.
Circulation Time (Arm to Tongue Time) in Large Pericardial Effusions: Aid in Differential Diagnosis Between Large Pericardial Effusion and Cardiac Dilatation. S. Bellet, C. S. Nadler and W. A. Steiger.—p. 856.
*Clinical Study of Visceral Lesions and Endocrine Disturbances in Eight Cases of Diffuse Scleroderma. J. R. Gil.—p. 862.
Congestive Heart Failure and Hyponatremia: Untoward Effects of Mercurial Diuresis. D. Citron, B. Bercu, R. Lemmer and E. Massie. —p. 872.
*Lymphangitic Carcinomatosis of Lungs: Six Case Reports and Review of Literature. T. E. Hauser and A. Steer.—p. 881.
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Clinical Value of Unipolar Extremity (aV) Leads. M. Sokolow.—p. 921.
Clinical Value of Needle Biopsy of Liver. L. Schiff.—p. 948.
*"Alveolar-Cell" Carcinoma of Lung. H. I. McCoy.—p. 968.
Erythema Nodosum: Possible Significance of Associated Pulmonary Hilar Adenopathy. C. C. Johnson, N. O. Hanson and C. A. Good.—p. 983.
Electrocardiographic Clue to Ventricular Aneurysm. R. V. Ford and H. D. Levine.—p. 998.
Hypertension in Older Age Groups. S. M. Krane and G. A. Perera. —p. 1017.

Visceral Lesions and Endocrine Disturbances in Scleroderma.—Six women and two men between the ages of 18 and 48 with diffuse scleroderma were studied from the clinical and laboratory point of view. The following characteristic clinical changes were noted: involvement of the digestive tract with mucosal atrophy, absence of peristaltic movements and dilatation of the esophagus, stomach, and small bowel, with a rather characteristic small bowel syndrome; involvement of the cardiovascular system, with globular enlargement of the heart due to connective tissue lesions and subsequent dilatation; electrocardiographic changes showing incomplete or complete right bundle branch block, or extensive auricular and ventricular myocardial lesions; heart failure with atypical manifestations, such as bradycardia and absence of edema in the sclerodermatous skin; joint manifestations without characteristic radiographic changes and no evidence of chronic joint changes; bone decalcification of the parts in which mobility of the joints is diminished, and hypoadrenalism, as judged by increased blood potassium, positive reaction to the Kepler test, low 17-ketosteroids, lymphocytosis, and disturbance of the protein, cholesterol, and carbohydrate metabolism. A hyaluronidase skin test was performed in three patients, and a large spreading of the enzyme was observed. This could be due to a diminished adrenal hormone elaboration. Three of the eight patients were subjected to a therapeutic trial with irradiated ergosterol. Three hundred thousand units were given daily by mouth to each patient, and, in addition, 500,000 units were given intramuscularly twice a week. While no modification of the general condition or of the visceral lesions was observed, the scleroderma of the skin was much improved. The changes observed were softening of the skin, better joint movements, and, from the histopathological point of view, a decrease of the connective tissue proliferation.

Lymphangitic Carcinomatosis of the Lungs.—The occurrence of lymphangitic carcinomatosis of the lungs is reported in six men between the ages of 46 and 71. Symptoms referable to the primary neoplasm were frequently absent, even up to the time of death. In some patients the symptoms due to the primary neoplasm were present but masked by the pulmonary symptoms. The most striking and constant observation was severe dyspnea, which appeared to be progressive and constant. Cough occurred in five patients and was productive of only small amounts of white, tenacious, occasionally blood-tinged sputum in three patients. Other striking features were general physical deterioration and cyanosis. Examination of the lungs disclosed relatively few signs, usually medium rales or occasionally sibilant rales with no evidence of consolidation. Evidence of cor pulmonale was revealed by electrocardiograms in three of the patients. The occurrence of a spontaneous pneumothorax in one patient was probably a result of a rupture of a subpleural bleb associated with compensatory emphysema. The roentgenograms of the chest revealed a pattern of thin, stringy lines with frequent interweaving branching out from the hilum. If such a roentgenogram is found with the above-mentioned symptoms, and miliary tuberculosis, fungous diseases, and occupational diseases are ruled out, lymphangitic carcinomatosis of the lung should be suspected. Sputum showed tumor cells in the two patients with bronchogenic carcinoma and pulmonary alveolar carcinoma respectively, although it is usually negative in carcinoma metastatic to the lungs. The method of spread of the neoplasm to the lymphatics of the lungs is probably by retrograde lymphatic permeation, with the tumor cells growing along lymphatic channels. In three patients the spread was from primary carcinoma of the stomach. Spreading of the tumor along the paraesophageal lymphatics thence through the hilar anastomoses into lung parenchyma as well as through a hematogenous route had been suggested. Necropsy was performed in all six cases and consistently showed fibrosing perivascular, vascular, and pulmonary changes regardless of the primary site of the carcinoma. These were of a degree sufficient to explain at least in part the clinical findings.

Alveolar-Cell Carcinoma of the Lung.—A man 60 and a woman 31 with alveolar-cell carcinoma are reported on. Dyspnea and cough were observed in both patients, who died in respiratory distress. Conclusive evidence of a malignant neoplasm was revealed by cytological examination of the bronchial aspirates in the female patient. A four-day course of nitrogen mustard therapy (methyl-bis [beta-chloroethyl] amine hydrochloride, 1 mg. per kilogram of body weight) was instituted, but it in no way altered the course of the disease. Necropsy in both cases revealed the characteristic microscopic findings of alveolar-cell tumors: In all lobes the lining of the alveoli varied from single-layered to pseudostratified and was made up of nonciliated cells varying from high cuboidal to columnar. The nuclei appeared hyperchromatic, large, and vesicular. The cells were pleomorphic, and some contained several nuclei. Mitotic figures could be demonstrated. There were papillary projections into the alveoli and exfoliation of single or groups of tumor cells. The cytoplasm and nuclei of the desquamated cells assumed a round to oval form. Except for some thickening, the alveolar walls were for the most part unaltered. At the periphery of the lung, uninvolved alveoli were present. No involvement of the bronchial tree was noted. The tumor cells did not resemble ciliated cells of bronchial epithelium. The site of origin is unexplained. The male patient had worked for 37 yr. with a mixture of tar, linseed oil, glycerin, and glue, while the female patient had worked for two years with an unproved irritant, consisting of zinc oxide and rosin dust. Although not yet conclusive, the bulk of evidence suggests that an alveolar lining may proliferate and give rise to tumors in response to various specific agents. In both of the author's cases the alveolar lesions could not be differentiated microscopically from so-called pulmonary adenomatosis. This resemblance has led to the suspicion that pulmonary adenomatosis is potentially malignant or precancerous. The striking morphological resemblance of pulmonary adenomatosis in man to jaagsiekte in sheep has been stressed. Pulmonary needle aspiration biopsy and cytological examination of sputum and bronchial washings are suggested as diagnostic measures.

Bulletin of Johns Hopkins Hospital, Baltimore

88:291-394 (April) 1951

Studies in Respiratory Air Flow: III. Mechanics of Respiration in Dog as Reflected by Changes in Intraperitoneal Pressure. A. C. Woods Jr., D. F. Proctor, J. P. Isaacs and B. N. Carter II.—p. 291.
Studies on Proteolytic Enzyme in Human Plasma: VI. Alterations in Plasma Fibrinogen and Proteolytic Activity in Pneumonia. O. D. Ratnoff.—p. 304.
Retraction of Clots Formed from Purified Fibrinogen. C. E. Ellicott and C. L. Conley.—p. 321.
Effects of ACTH and Cortisone on Antibodies in Human Beings. G. S. Mirick.—p. 332.
Significance of Personal Problems in Understanding and Treatment of Illness. G. C. Robinson.—p. 352.
Ligation of Hepatic and Splenic Arteries in Treatment of Portal Hypertension with Report of Six Cases: Preliminary Report. W. F. Reinhoff Jr.—p. 368.

California Medicine, San Francisco

74:225-364 (April) 1951

Western Equine and St. Louis Encephalomyelitis: Distribution and Histological Nature of Central Nervous System Lesions. K. H. Finley and A. C. Hollister.—p. 225.
Problem of the Poor Reader. A. Jampolsky.—p. 230.
Hemorrhage of Late Pregnancy. R. G. Douglas, R. Landesman and J. T. Cole.—p. 233.
New Position for Cholecystography (Kirklin). J. J. Wells.—p. 238.
Psychosomatic Approach to the Climacteric. M. Ross.—p. 240.
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Pterygia: Etiologic Theories, Methods of Treatment, and Results. R. E. Bartlett and C. S. Mumma.—p. 263.
Medicine in the Talmud. A. Bernstein and H. C. Bernstein.—p. 267.

Diseases of Chest, Chicago

19:373-480 (April) 1951

*Combined Effect of Potassium Iodide and Streptomycin on Far Advanced Chronic Pulmonary Tuberculosis. E. Woody Jr., H. E. Johnson, R. C. Avery and R. R. Crowe.—p. 373.
Comparative Morphology of Acid-Fast Bacilli. D. W. Will, F. Bishop, E. Bogen, A. H. K. Djang and C. M. Carpenter.—p. 387.
*Streptomycin and Artificial Pneumoperitoneum in Treatment of Pulmonary Tuberculosis. R. L. Brock.—p. 411.
Early Major Surgery After Streptomycin in Treatment of Acute Pulmonary Tuberculosis. J. K. Newton, L. M. Shefts and M. B. Cohen. —p. 424.
Streptomycin Para-Aminosalicylate in Treatment of Pulmonary Tuberculosis. E. Dunner and W. B. Brown.—p. 438.
Chest Survey in Large General Hospital. H. C. Ochsner.—p. 444.
Cystic Disease of Lung. J. D. Murphy and J. D. Piver.—p. 454.
Pulmonary Manifestations of Systemic Diseases. J. W. Middleton.—p. 473.

Potassium Iodide and Streptomycin.—Fifty-eight patients with far-advanced pulmonary tuberculosis with long-standing cavitation were selected for treatment. None had received streptomycin previously, and all had positive sputum at the beginning of treatment. Twenty-three patients received streptomycin alone for a period of 120 days, and 35 received combined treatment with streptomycin and potassium iodide over a similar period. Streptomycin was administered intramuscularly in a single injection of 1 gm. daily to each patient of both groups. Patients in the combined therapy group received, in addition, a total of 4 gm. of potassium iodide daily orally, administered in solution in three equal doses morning, noon, and night. All patients were restricted to complete bed rest and received a high protein, high carbohydrate diet. No evidence was found of any significant differences in temperature, pulse, respiration, erythrocyte count, or total or differential leukocyte count between the controls and the group receiving combined therapy. Four of the 23 patients in the control group and seven of the 35 in the combined therapy group ended the treatment period with three consecutive negative sputum examinations. Streptomycin-resistant organisms emerged in about half the cases between the 60th and 90th day, and by the end of the treatment period in all but six patients organisms had developed that were resistant to streptomycin in concentrations of 10 γ per cubic centimeter. Three of these six patients were in the control group; the other three were in the combined therapy group. Significant roentgenographic and nutritional changes were noted infrequently in the control group. Much improvement was noted in both chest roentgenogram changes and in weight in the combined therapy group. No evidence was found that potassium iodide was harmful in tuberculosis when administered in conjunction with streptomycin. The small cavities in the lungs of five patients receiving streptomycin and potassium iodide closed completely. For this reason it is believed that in selected cases this treatment may avert the need for surgical collapse therapy. Moreover, certain far advanced inoperable patients may be salvaged and made more suitable for surgical intervention.

Streptomycin and Artificial Pneumoperitoneum.—Treatment with streptomycin and pneumoperitoneum combined and with pneumoperitoneum alone was given to 117 patients with far-advanced pulmonary tuberculosis. In 11 patients, seven treated with the combined therapy and four with pneumoperitoneum alone, therapy was discontinued after an average of 2.2 mo. because it was ineffective or because the patient was lost to observation. Of the remaining 106 patients, 20 were treated in preparation for surgery and 86 had conservative treatment only. In the first group, 13 received the combined treatment and seven received pneumoperitoneum alone; in the second group, about half received the combined treatment and half received pneumoperitoneum alone. Before therapy, the patients being prepared for surgery had bilateral disease and an exudative component that precluded pneumothorax or any form of major surgery. After therapy, none of them had negative sputum and all but one had open cavities; however, all had some roentgenological clearing. Of the patients not being prepared for surgery, 77% had closed cavities after pneumoperitoneum alone and 80% had sputum conversion. In the combined therapy group, only 62% had closed cavities and 61% had negative sputum after treatment; however, in this group the disease was originally more exudative. It is concluded that the length of treatment with pneumoperitoneum is important in determining the eventual outcome of the case but the extent and character of the disease at the beginning of treatment are the deciding factors. The role of streptomycin and pneumoperitoneum in the restoration of the damaged drainage mechanism of the lung are discussed.

Gastroenterology, Baltimore

17:327-478 (March) 1951

Portal Cirrhosis: Analysis of 208 Cases, with Correlation of Clinical, Laboratory and Autopsy Findings. R. Armas-Cruz, R. Yazigi, O. Lopez and others.—p. 327.
*Psychotherapy of Ulcerative Colitis. J. Groen and J. Bastiaans.—p. 344.
Management of Massive Hemorrhage from Peptic Ulcer. A. R. Higgins and H. C. Barton Jr.—p. 353.
*Local and Systemic Effects of Cream on Blood Coagulation: Physiological Basis for Early Feeding in Gastrointestinal Bleeding. J. M. Waldron, B. Beidelman and G. G. Duncan.—p. 360.
Megacolon and Dilatation of Small Bowel in Parkinsonism. A. Lewitan, L. Nathanson and W. R. Slade Jr.—p. 367.
Regional Enteritis in Cuba. L. Falla, R. Albacete and P. Leon.—p. 375.
Splanchnicectomy: Its Clinical Effects on Gastrointestinal Tract. J. R. Ross and M. P. Brolsma.—p. 389.
Excretion in Bile of Urobilinogen Administered Orally and Parenterally. J. D. Mann and R. D. Koler.—p. 400.
Studies on Lysozyme as Etiologic Agent in Ulcerative Colitis. W. F. Nickel Jr., G. M. Gordon and W. D. Andrus.—p. 406.
Possible Role of Pancreatic Enzymes in Etiology of Ulcerative Colitis. M. Lake, W. F. Nickel Jr. and W. D. Andrus.—p. 409.

Psychotherapy of Ulcerative Colitis.—Because the emotional state of the patient is important in the course of ulcerative colitis the authors treated 12 male and 17 female patients with this disease by a supportive form of psychotherapy. Eighteen of the 29 cases were rated severe and 11 moderately severe. After a control period of at least 10 days, during which the patients were treated with bed rest and, if necessary, with rehydration and blood transfusions, psychotherapy was started. Psychoanalysis was not used in these cases. The authors explained to the patients that they were engaged in a study of relationships between life situations and disease in general. Most patients were eager to cooperate in this study. The patient was given an opportunity to discharge his aggressive feelings and he was given constant sympathy and protection, so that he might reassert himself. Improvement of social conditions and change in the attitude of parents, marriage partners, or employers also had a favorable effect on the course of the disease. The realization on the part of the medical and nursing staff that patients with ulcerative colitis are immature persons who should be treated as such and that the disease itself has contributed to their regression into more infantile feelings and behavior patterns has been important in obtaining satisfactory results. Fourteen of the 29 patients were clinically cured at the time of discharge. Temperature and sedimentation rate were normal, the bowel movements reduced to one or two a day, and the stools free of pus or mucus and of solid or semisolid consistency. X-ray findings did not return to normal, but the patients remained clinically cured for periods varying from one to nine years. Eight patients returned for one or more recurrences after initial cure. All these recurrences yielded to treatment along the same lines. In general, the success of treatment depended on the duration of the illness before psychotherapy was instituted, on the physical condition of the patient on admission, the time and care the physician was prepared to give him, and the cooperation obtained from those in the patient's environment. This type of "superficial" psychotherapy could be carried out as well by an internist as by a psychiatrist, provided that he is sufficiently interested. The results compared favorably with those obtained by certain forms of medical or surgical treatment.

Effects of Cream on Blood Coagulation.—Thirty patients who were routinely admitted to the hospital fasted for 12 hr. before a first sample of blood was collected by venipuncture for measuring the venous clotting time; then they were fed 60 ml. of 20% cream from cow's milk. The clotting time of whole venous blood was then measured at one-half hour, one, two, and three hours after ingestion of the cream. Control experiments, in which 60 ml. of water was used in place of the cream, were performed for determination of the normal fluctuations of the rate of coagulation over a four hour period with repeated venipunctures. Within one-half hour after the oral ingestion of cream the clotting time of whole venous blood was definitely decreased; the decrease occurred within one-half hour and reached a maximum in one hour persisting with minor fluctuations for the three hour observation period. A total of 100 patients were studied for varying periods with similar results. Subsequently, dilution of normal fasting blood with 10% cream in 0.85% isotonic sodium chloride solution produced a great drop in coagulation time. This suggests that cream may have a local hemostatic effect. In addition it may be expected to inhibit gastric motility, depress secretion, and act as a buffer on gastric acid. The early feeding of milk and cream in gastrointestinal bleeding would appear to be justified on a physiological basis.

Georgia Medical Association Journal, Atlanta

40:95-156 (March) 1951

Prolapse of Gastric Mucosa. A. P. McGinty.—p. 95.
Facial Angiomas Associated with Brain Tumor Calcification. J. J. Clark and R. M. Tankesley.—p. 99.
Management of Ambulant Arthritic Patient. A. M. Pruce.—p. 101.
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Proctoscopy in Diagnosis of Amebiasis. J. S. Schroder.—p. 107.
Aureomycin and Antihistamines in Treatment of the Common Cold. C. H. Chen and R. B. Dienst.—p. 109.
Problem of Gout. G. R. Dillinger.—p. 114.
Management of Pink Eye. W. P. Rhyne.—p. 118.

Geriatrics, Minneapolis

6:73-142 (March-April) 1951

Lecithin in Development and Prevention of Atherosclerosis. O. J. Pollak.—p. 73.
Sponge Biopsy in Screening for Uterine Cancer. B. L. Cinberg.—p. 81.
Morbid Anatomy of Old Age. T. H. Howell and A. P. Piggot.—p. 85.
Early Diagnosis and Management of Gout. F. D. Suttenfield.—p. 96.
Common Problems in Geriatric Surgery. L. Carp.—p. 100.
Hospital Care Goes Home. E. D. Rosenfeld, S. Eger, J. Axelrod and E. Margolin.—p. 112.

Journal Clin. Endocrinology, Springfield, Ill.

11:343-454 (April) 1951

Linear Growth Responses of Boys to Prolonged Treatment with Chorionic Gonadotropin. G. B. Dorff and I. M. Hudson.—p. 343.
Distribution of Chorionic Gonadotropin in Mother and Fetus at Various Stages of Pregnancy. J. A. Bruner.—p. 360.
*Prolonged Treatment of Case of Periarteritis Nodosa with ACTH: Effective Dose as Measured by Metabolic Balances. M. H. Levin, W. S. Adams, W. S. Beck and others.—p. 375.
Response of Patients with Bronchial Asthma to Epinephrine and to Adrenocorticotropic Hormone. D. Hioco, M. Samter, R. M. Kark and W. R. Best.—p. 395.
Metabolism of Ethinyl Estradiol in Man. B. F. Stimmel and J. A. May.—p. 408.
Studies on Conversion of Testosterone to Urinary 17-Ketosteroids in Normal Human Males and Males with Hepatic and Other Diseases. W. W. Engstrom, P. L. Munson, L. Cook and P. J. Costa.—p. 416.
Studies of Metabolism of Testosterone in Normal Women in Different Phases of Menstrual Cycle. W. W. Engstrom and P. L. Munson.—p. 427.
Iodine Vapor Stained Vaginal Smear: Its Use in Office Practice. H. W. Jones Jr. and L. M. Hurxthal.—p. 434.

Periarteritis Nodosa: *Late Results with ACTH.*—Metabolic studies of the effect of pituitary adrenocorticotropic hormone (ACTH) in a patient with periarteritis nodosa were continued for 145 days. Clinical and pathological remission occurred. Cure was not effected, but pronounced physical improvement has been sustained for 14 months. The eosinophils decreased dramatically with pituitary adrenocorticotropic hormone and disappeared from the peripheral blood after 48 hours. They did not reappear until two days after discontinuance of therapy. Changes in the eosinophil count were correlated closely with metabolic effects and clinical progress. The hormone had a pronounced catabolic effect on nitrogen balance; administration of 40 mg. daily produced a strongly negative nitrogen balance while the patient was on a maintenance diet; this dosage was also sufficient to negate completely the marked nitrogen retention induced by a high protein, high caloric diet. Evidence is presented that this effect was due to the hormone and not merely to repletion of body protein. There was temporary moderate retention of sodium and chloride during the first days of each course of pituitary adrenocorticotropic hormone therapy, followed by an escape from adrenal cortical control, as evidenced by reestablishment of equilibrium. The effect of pituitary adrenocorticotropic hormone on potassium was in most respects opposite to that on sodium and chloride. An early potassium diuresis occurred while salt was being retained, followed by potassium retention and then a gradual increase in urinary excretion until the balance became distinctly negative. Pituitary adrenocorticotropic hormone caused a definite increase in fecal and urinary loss of calcium and phosphorus. Once full effect was obtained by 40 mg. of the hormone per day, successive decrements in dosage were not accompanied by proportionate decreases in the excretion. The metabolic responses to the hormone were similar to those observed in normal persons. The authors conclude that maintenance of adequately high levels of adrenal cortical function with relatively smaller amounts of pituitary adrenocorticotropic hormone seems feasible after the gland has been stimulated with sufficiently large priming doses.

Journal of International College of Surgeons, Chicago

15:391-530 (April) 1951

Multiple Visceral Resections. D. Sauer and V. T. Houston.—p. 391.
Diagnosis and Surgical Treatment of Cervical Lesions of Intervertebral Disc. E. Walker, W. W. Moore and J. R. Simpson.—p. 411.
Exclusion Resection (Finsterer) for Nonresectable Duodenal Ulcers. A. Plenk and H. Schrom.—p. 419.
Splanchnicotomy for Prevention and Treatment of Urologic Disturbances in Diseases of Spinal Cord. V. K. Boshamer.—p. 424.
Pitfalls to be Avoided in Thyroidectomy: Triangle for Localization and Protection of Recurrent Nerve. M. M. Simon.—p. 428.
Tumors of Jaws. G. E. Ward and J. W. Hendrick.—p. 443.
Etiology of Strictures Occurring After Prostatic Operations. M. L. Brodny and S. A. Robins.—p. 459.
Problem of "Bleeding Nipple." M. Cutler.—p. 472.
Ureterovaginal Fistula. G. J. Thompson and V. S. Counseller.—p. 479.
Relation of Cellular Oxidation to Cancer. G. Williams.—p. 488.
Metallic Femoral Head Prosthesis for Hip Joint. E. D. McBride.—p. 498.

Journal of Nervous and Mental Disease, New York

113:283-376 (April) 1951

Review of Electrocardiographic Changes in Emotional States: With Clinical Note on Electrocardiograms of 193 Psychotic Patients. G. E. Blom.—p. 283.
Physiologic Observations on Spinal Cord Function in Paraplegics. R. A. Kuhn.—p. 301.
Part I. Migraine as Form of Neurasthenia. M. Gans.—p. 315.
Sexual Behavior After Lobotomy. J. Levine and H. Albert.—p. 332.
Contested Wills. W. G. Eliasberg.—p. 342.

Journal of Neurosurgery, Springfield, Ill.

8:135-246 (March) 1951

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Neurosurgical Aspects of Cryptococcosis. C. A. Carton and L. A. Mount.—p. 143.
Focal Epilepsy of Psychomotor Type: Preliminary Report of Observations on Effects of Surgical Therapy. J. R. Green, R. E. H. Duisberg and W. B. McGrath.—p. 157.
Ménière's Disease and Its Surgical Treatment: Report of 300 Cases. F. Castellano.—p. 173.
Metastatic Hypernephroma of Brain from Neurosurgical Point of View: Report of 19 Cases. T. P. Störtebecker.—p. 185.
Experimental Application of Ultrasonics to Localization of Brain Tumors: Preliminary Report. L. A. French, J. J. Wild and D. Neal.—p. 198.
Treatment of Obstructive Hydrocephalus by Puncture of Lamina Terminalis and Floor of Third Ventricle. J. E. Scarff.—p. 204.

8:247-354 (May) 1951

Walter E. Dandy—Surgeon (1886-1946). E. Campbell.—p. 249.
*Acute Subdural Haematoma. J. W. Chambers.—p. 263.
Notes on Collateral Cerebral Circulation as Demonstrated by Carotid Angiography. A. Torkildsen and K. Koppang.—p. 269.
Tracer Studies with Radioactive Phosphorus (P^{32}) on Absorption of Cerebrospinal Fluid and Problem of Hydrocephalus. J. E. Adams.—p. 279.
Studies in Neurosurgical Electroencephalography: I. Standard Electrode Placement. B. D. Wyke.—p. 289.
Catabolic Effect of Craniotomy and Its Investigative Treatment with Testosterone Propionate. I. S. Cooper, E. H. Rynearson, C. S. MacCarty and M. H. Power.—p. 295.
Evaluation of Technic and Results of Radioactive Di-Iodo-Fluorescein Test for Localization of Intracranial Lesions. M. Ashkenazy, L. Davis and J. Martin.—p. 300.

Acute Subdural Hematoma.—Any patient seen in the emergency ward after head trauma who shows progression in neurological changes and deepening of the state of unconsciousness requires exploratory trephination immediately, so that the actual bleeding points may be found and sealed off. It has been the author's experience in cases of massive acute subdural hematoma that the bleeding has originated at the base rather than the vertex. In the presence of clots large enough to cause signs and symptoms by compression, the bleeding is usually from the inferior cerebral veins running from the inferior surface of the temporal and occipital lobes to the transverse sinus, sphenoparietal sinus, and superior petrosal sinus. These veins may be lacerated or even torn from the sinus, with severe, rapid bleeding. The author's operative approach permits rapid accessibility to the commonly involved vessels. Two cases of acute subdural hematoma following automobile accidents are reported in which this more posterior approach was used. A curved incision is carried posteriorly above and behind the ear and, depending on the patient's condition and the rapidity of blood loss, a small bone flap is turned down, hinged on the temporal muscle, when speed is less important, while the muscle is stripped downward from the bone and the bony defect rapidly enlarged with the rongeurs in cases in which speed is essential. Bleeding from veins or sinuses is stopped by cautery, absorbable gelatin sponge, (gelfoam®), and thrombin solution. The dura is left open to permit postoperative decompression. The muscle is closed over the bony defect. No cranioplasty was considered necessary at a later date in these cases. A certain number of patients with acute subdural hemorrhage have little or no brain damage other than secondary to compression by clot. With immediate action and in some cases with the outlined modified operative approach many of these patients can be saved.

J. Pharmacology & Exper. Therap., Baltimore

101:243-316 (March) 1951

Analysis of Actions of Acetylcholine, Atropine, Epinephrine and Quinidine on Heart Muscle of Cat. J. R. DiPalma and A. V. Mascatello. —p. 243.
Studies on Urinary, Fecal and Biliary Excretion of *d,l* Methadone by Countercurrent Distribution. E. L. Way, B. T. Signorotti, C. H. March and Chin-Tzu-Peng.—p. 249.
Some Aspects of Metabolism of Codeine in Rat. M. E. Latham and H. W. Elliott.—p. 259.
Trypanocidal Activity and Arsenic Content of Rat Blood Following Intravenous Administration of Oxophenarsine Hydrochloride. L. Peters and H. N. Wright.—p. 268.
Absorption and Distribution of Salicylamide. V. P. Seeberg, D. Hansen and B. Whitney.—p. 275.
Renal Response to Thyroxin Administration. C. A. Handley, J. H. Moyer, O. Kennedy and P. Costa.—p. 283.
Metabolism of Heart in Relation to Drug Action: VI. Metabolic Actions of Quinidine on Rat Heart Muscle. J. L. Webb, P. R. Saunders and K. Nakamura.—p. 287.
Renal Clearance of Barbital and Mechanism of Its Reabsorption. A. Giotti and E. W. Maynert.—p. 296.
Role of Vagus Nerves in Depressor Action of Veratrum Derivatives. J. W. Stutzman, H. Simon and G. L. Maison.—p. 310.
Estimation of Antipyretic Activity of Cinchoninic Acid Derivatives. T. H. Maren.—p. 313.

Journal of Thoracic Surgery, St. Louis

21:325-432 (April) 1951

Use of Streptokinase-Streptodornase in Treatment of Chronic Empyema: With Interpretive Discussion of Enzymatic Actions in Field of Intrathoracic Diseases. W. S. Tillett, S. Sherry and C. T. Read.—p. 325.
Serum Protein Levels and Calculated Osmotic Pressures in Tuberculosis: I. Correlation of These Values with Severity of Disease. R. M. Eaton, J. V. Sherwood, P. L. Kendrick and others.—p. 342.
*Bronchial Adenoma: Nomenclature and Present Methods of Treatment. R. D. Doty.—p. 349.
Bronchial Adenoma in Supernumerary Tracheal Lobe: Report of Unusual Case. I. Epstein.—p. 362.
Review of Surgically Treated Lung Abscess. L. H. Bosher Jr.—p. 370.
Bronchoscopy in Treatment of Spontaneous and Traumatic Pneumothorax. M. Rubin and E. H. Rubin.—p. 377.
Pulmonary Artery in Bronchiectasis. W. G. Gobbel Jr., J. Gordon and G. J. Digman.—p. 385.
Liver Herniation Simulating Intrathoracic Tumor. C. G. Child III, G. S. Harmon, C. T. Dotter and I. Steinberg.—p. 391.
Unusual Diaphragmatic Hernia with Displaced Liver. L. F. Knoepp. —p. 394.
Homotransplantation of Tracheal Segments Preserved by Lyophilization: Experimental Study. A. G. Marrangoni.—p. 398.
Bronchiogenic Neoplasm Masquerading as Alveolar Cell Carcinoma: With Report of Case Clarified Only by Autopsy. W. L. Potts and H. B. Davidson.—p. 402.
Lateral Costal Branch of Internal Mammary Artery. B. N. Kropp.—p. 421.
Anesthetic Explosions: Case Report. M. G. Buckles.—p. 426.

Bronchial Adenoma.—Four cases of bronchial adenoma are discussed. Attention is called to the confusion resulting from the use of varying and nondescript nomenclature. It is suggested that "adenoma" be reserved for the group as a whole and that "carcinoid adenoma" and "mixed tumor adenoma" be exclusively subclassifications. The term "cylindroma" should be discarded. Until 1937 little question was raised regarding the supposedly benign nature of these lesions, and major surgical procedures were undertaken only when necessitated by complications. Since then various improvements in surgical techniques and methods of treatment and the continual reports indicating malignant characteristics in these lesions have demonstrated that surgical exploration, usually with resection, should be the preferred method of treatment. If the tumor invades at all, then only rarely will it be possible to remove it bronchoscopically with certainty that it has been adequately removed. Only surgical exploration can offer clear evaluation of the condition and permit definitive treatment, because the bronchial adenoma extends or metastasizes peribronchially and to the mediastinum. The authors conclude that in the majority of cases surgical exploration with lobectomy or pneumonectomy and removal of mediastinal nodes, where indicated and possible, is the procedure of choice. In any patient suffering from repeated episodes of pulmonary inflammation, chronic cough, and hemoptysis, without adequate explanation, bronchial adenoma should be suspected and ruled out.

Maine Medical Association Journal, Portland

42:113-132 (April) 1951

Report of Case of Hyperinsulinism. W. F. Mahaney.—p. 113.
Aneurysm of Left Cardiac Ventricle. C. L. Holt.—p. 117.
Idiopathic Dilatation of Esophagus (Achalasia, Cardiospasm): Report of Case. S. F. Fox.—p. 120.
Hypersplenism: Unusual Case of Splenic Pancytopenia Secondary to Gaucher's Disease in Adult. W. C. Burrage.—p. 124.

Military Surgeon, Washington, D. C.

108:287-368 (April) 1951

Spatial Disorientation in Flight. A. Graybiel.—p. 287.
Rupture of Colon Due to Compressed Air, with Particular Reference to Character of Lesion. R. L. Waugh and F. C. Leonard.—p. 294.
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Medical Aspects of Naval Air Reserve. R. B. Phillips.—p. 304.
Bacteriology of Eye Infections in the Mid-West, U. S. A. R. I. Pritikin, M. L. Duchon and H. S. Farmer.—p. 309.
Flexible Shaft Motor for Endaural and Other Otolaryngic Surgery with Report of Illustrative Cases. K. Sommers.—p. 313.
Cushing's Syndrome Associated with Adenoma of Adrenal Cortex. J. T. Rush and J. H. Forsee.—p. 319.
Subsequent Report on Dramamine: Prophylactic and Therapeutic Control of Motion Sickness and Vestibular Disturbances. L. N. Gay.—p. 324.
Occupational Therapy's Part in Rehabilitation of Chronic Neurological Patient. M. D. Clarke.—p. 331.

Missouri State Medical Assn. Journal, St. Louis

48:265-348 (April) 1951

Treatment of Fractures of Femoral Shaft with Medullary Nail. F. C. Reynolds.—p. 281.
Pitfalls in Management of Nodular Goiter. R. W. Bartlett.—p. 285.

New England Journal of Medicine, Boston

244:537-576 (April 12) 1951

Effect of Ileostomy and Colectomy on Personality Adjustment of Patients with Ulcerative Colitis. B. V. White.—p. 537.
Follow-Up Study of Lung-Cancer Suspects in Mass Chest X-Ray Survey. C. L. Scamman.—p. 541.
*Cat-Scratch Fever: Disease Entity. W. E. R. Greer and C. S. Keefer. —p. 545.
*Severe Hypoprothrombinemia Following Propylthiouracil Treatment of Thyrotoxicosis. C. G. Craddock Jr., D. Shotton, C. L. Crockett and B. S. Leavell.—p. 549.
Medicine as Science: Roentgenology. M. C. Sosman.—p. 552.

Cat-Scratch Fever.—The occurrence of cat-scratch fever is reported in a man 36, who two weeks before admission to the hospital awakened to find his cat licking the left side of his neck in an area containing two pimples. He was scratched on the right hand at about the same time. Ten days before admission the patient noted a painless swelling of a lymph node on the left side of his neck, which increased to the size of a hen's egg. The temperature rose to 102 F., and a pinkish macular rash that gradually developed into small vesicles was noted over the extensor surfaces of the patient's arms. Nose and throat cultures were negative for pathogenic agents as were tularemia agglutination tests. The patient's cervical lymph node spontaneously drained on the fourth hospital day. It was cultured, a skin antigen prepared from the material by the classic Frei procedure, and 0.1 cc. was injected intradermally. A positive reaction was noted at 24 and 48 hr. Six control patients showed no reaction to intradermal injection of this material. An intradermal injection of 0.1 cc. of an antigen prepared by Foshay from a former cat fever patient's bubo was given to the patient, and a positive reaction was observed at 24 hr. The reaction was maximal at 48 hr. and persisted for a few days. The antigen was tested on six control patients; no reaction was noted. These results seem to indicate a high specificity of this antigen. The term cat-scratch fever was coined by Foshay of Cincinnati for the disease characterized by a history of domestic cat scratches followed by a systemic infection with malaise and fever in which the brunt of the infection is borne by the lymph nodes. Occasionally, lesions similar to exanthems or erythema nodosum may occur. The infective agent has never been isolated but is apparently a virus; it is present in the pus from lymph nodes involved and produces a specific skin reaction when made into an antigen. No specific therapy is yet indicated.

Hypoprothrombinemia Following Propylthiouracil Treatment.—Severe hemorrhagic diathesis appeared during the course of propylthiouracil treatment for thyrotoxicosis in a girl 16. The fundamental defect was transient, pronounced prolongation of the prothrombin time. The prothrombin deficiency occurred as an isolated phenomenon without evidence of liver damage or depression of white blood cells. The actual deficiency proved to be mainly one of accelerator globulin. Treatment with fresh human serum caused a fall in prothrombin time and cessation of hemorrhage. The hemorrhagic tendency was controlled with fresh serum and blood, and a subtotal thyroidectomy was successfully carried out. The temporary nature of the hypoprothrombinemia in the absence of a disturbance of hepatic function strongly suggests the type of reaction due to drug intoxication. No previous incident of isolated prothrombin deficiency without other signs of hepatic damage has been noted after the use of thiourea derivatives.

Oklahoma State Medical Assn. J., Oklahoma City

44:123-162 (April) 1951

Some Misconceptions of Gastro-Intestinal Tract in Children. J. S. Bouslog.—p. 126.
NPH Insulin. K. M. West.—p. 132.
Cross-Eyed Child. A. N. Lemoine Jr.—p. 135.
Flexion Treatment of Low Back Pain. W. L. Waldrop and H. B. Shorbe.—p. 138.

Pediatrics, Springfield, Ill.

7:457-606 (April) 1951

*Nephrotic Syndrome: Effect of Adrenocorticotrophic Hormone. C. M. Riley.—p. 457.
Response of Serum Hyaluronidase Inhibitor and Mucoproteins to Adrenocorticotropic Hormone in Rheumatic States: Mucolytic Enzyme Systems XV. F. H. Adams, V. C. Kelley, P. F. Dwan and D. Glick.—p. 472.
Studies on Laboratory Diagnosis of Cystic Fibrosis of Pancreas: Positive Gelatin Film Tests Due to Gelatin-Liquefying Bacteria in Feces and Duodenal Juice. D. E. Johnstone and E. Neter.—p. 483.
Studies in Steatorrhea: Effect of Level of Dietary Fat upon Absorption of Fat and Other Foodstuffs in Idiopathic Celiac Disease and Cystic Fibrosis of Pancreas. A. W. Chung, S. Morales, S. E. Snyderman and others.—p. 491.
Galactosemia: Report of Four Cases. G. N. Donnell and S. H. Lann.—p. 503.
Hyperpotassemia and Body Water Distribution in Anuric Child. R. Schwartz, E. J. Tomsovic and I. L. Schwartz.—p. 516.
Effect of Tetraethylammonium Chloride (Etamon Chloride) on Muscle Spasm in Poliomyelitis. D. N. Walcher, J. R. Scott and F. C. Ekstam.—p. 524.
Hypertension in Poliomyelitis with Respiratory Paralysis: Report of Protracted Case with Necropsy Findings. L. W. Sennett, M. A. Perlstein, M. B. Andelman and others.—p. 529.
Pneumatosis Intestinalis: Review of Literature with Report of 13 Cases. E. P. MacKenzie.—p. 537.
*Outbreak of Aerobacter Infections on Infants' Wards. M. H. D. Smith, C. G. Loosli and M. H. Ritter.—p. 550.
Safety Apparatus for Intravenous Therapy. J. P. Fletcher.—p. 563.
Plasma and Erythrocyte Chemistry of Normal Infant from Birth to Two Years of Age. R. R. Overman, J. N. Etteldorf, A. C. Bass and G. B. Horn.—p. 565.
Volumetric and Microscopic Pattern of Bone Marrow in Normal Infants and Children: I. Volumetric Pattern. P. Sturgeon.—p. 577.

Corticotrophin in Nephrotic Syndrome.—Fourteen patients aged less than 16 with the nephrotic syndrome were treated with corticotrophin (ACTH). All showed the classic features of anasarca, hypoproteinemia, massive proteinuria, and hypercholesterinemia. The drug was administered intramuscularly in doses of 60 mg. daily in four divided doses of 15 mg. every six hours, for four to six days. Five patients given eight courses showed complete clearing of edema in seven instances, one patient showing no response to a second course. Four patients given six courses showed significant but incomplete clearing of edema each time. Five patients showed no clinically significant response to seven courses. The type of diuresis with regard to salt and water excretion was similar to that seen in spontaneous diuresis. All but one of the patients who failed to have a clinically significant response did, nevertheless, show a slight sodium diuresis after withdrawal of the drug. There were no consistent changes in the significant chemical findings in the blood, except that in most cases, regardless of clinical results, a drop in the total cholesterol level was observed after treatment. In several patients who received sodium lactate by mouth following diuresis edema did not develop and there was a pronounced increase in the urinary sodium. This suggests that at least temporarily their kidneys were capable of dealing with sodium in normal fashion. The patients were followed up for seven to 15 mo. after treatment. Some remained symptom-free, others relapsed several times but responded to subsequent periods of treatment, and still others after early successes failed to respond to later administration of corticotrophin. Only one of the group showed clearing of the urine suggesting a permanent remission. Thus the hormone at best offers only a means of controlling edema of the nephrotic syndrome. Whether its repeated use may alter the over-all prognosis can only be determined after a much longer period of observation. But even if not curative, corticotrophin permits the induction of diuresis with fair regularity under controlled conditions and thus should prove a useful tool in the study of the mechanism of diuresis.

Aerobacter Infections on Infants' Wards.—A self-limited outbreak of infection due to a previously undescribed encapsulated gram-negative rod is reported on. It occurred in the course of a study on the control of airborne infection carried out on two infants' wards, one being kept as a control ward, while triethylene glycol was vaporized in the test ward. The morphological and cultural characteristics of the pathogen place it in the Aerobacter-Klebsiella group. It was readily identified by its capsular swelling in the presence of serums against types 23 and 32 pneumococcus. Serologic studies showed it to be antigenically related to certain other strains of encapsulated, gram-negative rods, but not to Friedländer's bacillus, Hemophilus influenzae, meningococcus, or pneumococcus other than the types mentioned above. In some of the patients who acquired the organism mild respiratory infections or diarrhea developed, accompanied by fever, but most patients remained asymptomatic. The organism spread in epidemic fashion on both glycolized and control wards and was recovered from the nasopharynx of 50 of a total of 361 patients included in the study, also from many nurses, attendants, and visitors. In the course of the epidemic the ward environment (air, dust, furniture, and bedclothes) became heavily contaminated. It is postulated that patients with profuse nasal discharge and diarrhea may have served to infect the ward environment, which in turn served as the source of infection to other patients.

Pennsylvania Medical Journal, Harrisburg

54:193-288 (March) 1951

Modern Concepts of Endocrinologic Therapy in Pregnancy. E. G. Waters.—p. 217.
Immunization Program in Pediatrics. F. T. O'Donnell.—p. 222.
Management of Hydronephrosis. B. Hughes and J. F. Sullivan.—p. 226.
Observations in Penicillin-Treated Cardiovascular Syphilis. J. Edeiken, W. T. Ford and J. H. Stokes.—p. 229.
Role of Antibiotics in Modern Treatment of Syphilis. H. R. Vogel.—p. 234.

54:289-400 (April) 1951

Use and Abuse of Anticoagulant Drugs in Clinical Practice. I. S. Wright.—p. 313.
Emotional Factors in Cardiovascular Disease. E. Weiss.—p. 319.
Benefits of Surgery in Pulmonary Tuberculosis. R. H. Overholt and N. J. Wilson.—p. 324.
Reconstructive Surgery of Hand. W. L. White.—p. 330.
Case for Histamine as Basis of Allergic Reactions: Attempts at Its Neutralization. W. C. Spain and E. H. Roston.—p. 334.
Protein Metabolism in Relation to Nutritional Aspects of Medical Diseases. H. A. Taggart.—p. 339.
Diagnosis of Arthritis. P. J. Warter.—p. 344.
Treatment of Obesity. J. M. Strang.—p. 346.
Herniation of Lumbar Intervertebral Disk: Ten-Year Follow-Up Study. F. H. Bragdon and W. A. Shafer.—p. 350.
*Radioactive Iodine in Treatment of Angina Pectoris. C. C. Wolferth, R. H. Chamberlain and J J. Mead.—p. 352.

Radioactive Iodine in Treatment of Angina Pectoris.—The effect of radioactive iodine (I^{131}) on severe angina pectoris was studied in 28 presumably euthyroid patients who had received 15 to 20 mc. of the drug. All patients were followed for six months to two years. All had been previously treated for long periods by conventional methods, either without satisfactory improvement or with actual increase in symptoms. Many had had one or more recognized attacks of myocardial infarction. Six others had aortic valvular disease with great enlargement of the left ventricle. Nine had had congestive heart failure, and nine had fairly severe hypertension. Of the 28 patients, 10 died, but there was no evidence that radioactive iodine had anything to do with the deaths. The possibility that deposition of cholesterol in coronary arteries may be accelerated after thyroid function is depressed cannot be excluded. Of the remaining 18 patients, results were arbitrarily designated as good in 12, fair in four and unsatisfactory in two. Until more time has elapsed, the duration of beneficial effects cannot be determined. In many of the authors' cases improvement was maintained for over a year. The authors are convinced that radioactive iodine has a place in the treatment of severe, otherwise intractable angina pectoris, as well as in certain cases of severe congestive heart failure or abnormal cardiac mechanisms with poorly controlled tachycardia. A tracer dose should always precede treatment, affording a rough estimate of what the treatment dose will accomplish. The criteria for the selection of patients with angina pectoris for treatment with radioactive iodine cannot be established until much more experience with this method of treatment has accumulated and, if possible, procedures developed by which the effect on the thyroid gland can be predicted more accurately.

Postgraduate Medicine, Minneapolis

9:279-374 (April) 1951

Coronary Occlusion and Coronary Insufficiency. A. M. Master and H. L. Jaffe.—p. 279.
Acute, Recurring and Chronic Pancreatitis. J. T. Priestley.—p. 287.
Highlights in Medical Ophthalmology: Schneider Foundation Eye Presentation. C. Berens.—p. 293.
Pathology and Present Treatment of Ovarian Cysts. R. C. Benson.—p. 313.
Treatment of High Diastolic Type of Essential Hypertension: Combined Use of Thiocyanates and Sympathectomy. L. Davis.—p. 321.
Diagnosis and Treatment of Polycythemia Vera. E. H. Falconer.—p. 325.
Significance of Frequency of Urination. H. L. Kretschmer.—p. 331.

Psychiatry, Washington, D. C.

14:1-126 (Feb.) 1951. Partial Index

Anticipation of Arousing Specific Neurotic Feelings in the Psychoanalyst. L. B. Hill.—p. 1.
Culture and Personality: Natural History of False Dichotomy. M. E. Spiro.—p. 19.
Personality as Factor in Administrative Decisions. M. B. Cohen and R. A. Cohen.—p. 47.
Some Current Concepts of Sexual Behavior. J. H. Masserman.—p. 67.
Psychiatry in Prison. H. Powelson and R. Bendix.—p. 73.

Radiology, Syracuse, N. Y.

56:321-484 (March) 1951

The Radiologist—Some of His Problems: Presidential Address. W. W. Furey—p. 321.
Can Voluntary Insurance Do the Job? L. S. Goin.—p. 327.
Anatomy of Bronchopulmonary Segments: Clinical Applications. G. R. Krause and M. Lubert.—p. 333.
Laminagraphy in Diagnosis of Nasopharyngeal Tumors. B. S. Epstein.—p. 355.
Horner's Syndrome: Roentgen Manifestations. R. Pomeranz.—p. 363.
Mesenteric Lipoma: Report of Case with Distinctive Roentgenographic Features. E. F. Everett and D. L. Fink.—p. 370.
Pituitary Irradiation in Prostatic Carcinoma. W. T. Murphy and H. Schwippert.—p. 376.
Roentgen Therapy of Pituitary Adamantinomas (Craniopharyngiomas). E. T. Leddy and T. M. Marshall.—p. 384.
Preliminary Clinical Experience with Betatron. R. A. Harvey, L. L. Haas and J. S. Laughlin.—p. 394.
Problems of Clinical Radiobiology. J. E. Thygesen.—p. 403.
Threshold Visibility of Pulmonary Shadows. R. R. Newell and R. Garneau.—p. 409.
Diagnostic Accuracy of Roentgen Examination in Diseases of Upper Gastro-Intestinal Tract. T. J. *Haley and W. M. Sennott*.—p. 416.
*Radiation Sickness and Its Treatment with Dramamine. E. DeFeo, P. H. Reitman and M. H. Nathan.—p. 420.
Situs Inversus of Abdominal Viscera with Volvulus of Large Bowel: Report of Case. H. G. Jacobson and W. H. Camp.—p. 423.
Fracture of Spinous Processes: "New" Sign for Recognition of Fractures of Cervical and Upper Dorsal Spinous Processes. P. Zanca and E. A. Lodmell.—p. 427.

Dramamine in Radiation Sickness.—Because dimenhydrinate (dramamine) had proved effective in the nausea and vomiting of motion sickness, it was administered to 100 patients with radiation sickness following deep roentgen therapy. It was given half an hour before each meal and at bedtime, as soon as symptoms appeared. Since all radiation treatments were given between 8:30 a. m. and 12:30 a. m., the maximum time elapsing between a treatment and any one dose of dimenhydrinate was two hours, and in the majority of instances the interval was much shorter. Symptoms of radiation sickness appeared on an average of 5.3 days after treatment had been instituted. In only 46 of these 100 patients was improvement noted. One-half of this number had no recurrence of symptoms after administration of the drug for one day (400 mg.). In the rest, it had to be given daily throughout the period of irradiation. In the latter group symptoms recurred on an average of 2.1 days after the drug was discontinued. Placebos could be given at intervals during irradiation in 24 of the 46 patients claiming improvement with dimenhydrinate. Seventeen of the 24 patients did as well with the placebo as with the drug itself, reducing the number of patients whose improvement could be credited to dimenhydrinate to 29.

56:485-638 (April) 1951

Development of Angiocardiography and Aortography. Carman Lecture. W. G. Scott.—p. 485.
Primary Tumors of Ureter: Their Roentgen Diagnostic Features. R. B. Holmes.—p. 520.
Pancreatitis: Its Preoperative Diagnosis by Gastro-Intestinal Roentgenography. C. Gottlieb, M. Dorfman and H. A. Cregg.—p. 528.
*Sex Hormones and Castration in Advanced Breast Cancer. I. T. Nathanson.—p. 535.
Radioactive Cobalt 60 in Plastic Tubing for Interstitial Radiation Therapy. J. L. Morton, G. W. Callendine Jr. and W. G. Myers.—p. 553.
Air-Contrast Colon Examination with Colloidal Barium. H. H. Jones, H. S. Kaplan and F. Windholz.—p. 561.
Pneumomediastinum in Newborn: Report of Case. E. J. Keeffe and C. F. Jones.—p. 567.
Benign Polyp of Ampulla of Vater. H. P. Smith Jr. and W. S. Blakemore.—p. 571.
Cervical Hernia of Lung. W. L. Palazzo and T. A. Garrett.—p. 575.
Colorimetric Dosimeter for Qualitative Measurement of Penetrating Radiations. G. V. Taplin and C. H. Douglas.—p. 577.

Hormones and Castration in Breast Cancer.—According to Nathanson, surgery and irradiation remain the preferred methods for permanent or palliative control of localized and accessible manifestations of breast cancer. There is now indisputable evidence that the course and character of some breast cancers may be retarded or accelerated by administration or deprivation of sex hormones. There is no evidence that sex hormones or castration result in permanent control of even the most susceptible cancers of the breast, for the effects are temporary and usually of short duration. Consequently, the administration of androgens and estrogens as well as castration can be considered as a third method of attack, but only from the standpoint of palliation. It is of greatest value when the disease is beyond the realm of possible benefit from established procedures. Some advanced primary breast cancers may be rendered susceptible to palliative surgical attack when significant regressions occur after castration or hormonal therapy. Estrogens given in conjunction with irradiation may enhance the effect of irradiation. In addition, partial regression of lesions after initial treatment with estrogens may permit even more effective radiation therapy, made possible through the use of smaller portals. Estrogen therapy of recurrences within an area of previous and initially effective irradiation is ordinarily not as efficacious as it is for similar untreated lesions. Irradiation therapy of localized osseous metastases from breast cancer may alleviate pain and promote calcification of osteolytic lesions that initially respond to hormonal therapy and undergo reactivation or are primarily hormone-resistant. Contrariwise, hormones or castration may favorably influence osseous metastases that are resistant or recrudescent after preliminary irradiation. The possibility of serious complications with intensive hormone therapy emphasizes the extreme caution that must be exercised during the entire treatment period. The effects of hormones on breast cancer seriously challenge the long-held concept of autonomy of the cancer cell. The observations indicate that some cells judged neoplastic by classic definitions are apparently susceptible to direct attack or through changes in their environment by agents that are essentially physiological in action.

Tennessee State Medical Assn. Journal, Nashville

44:127-164 (April) 1951

Clinical Experience with Intravenous Tetracaine (Pontocaine): Report of 160 Cases. J. S. Horan.—p. 127.
Intra-Ocular Foreign Bodies: Diagnosis, Complications, and Surgical Treatment. D. F. Fisher and D. H. Anthony.—p. 130.
Retinal Detachment with Special Reference to Preoperative Subretinal Drainage. J. M. Wilson.—p. 137.
Contact Dermatitis. F. G. Witherspoon.—p. 141.

FOREIGN

Acta Medica Scandinavica, Stockholm

139:167-252 (March 17) 1951. Partial Index

Arteriovenous Fistula of Lung: Report of Four Cases, Including an Acyanotic Case. H. A. Salvesen and F. Marstrander.—p. 167.
Clinical Significance of Deep Q Wave in Third Lead of Electrocardiogram. H. Ljunggren.—p. 176.
Excretion of Pantothenic Acid in Patients. V. Schmidt.—p. 185.
*Histoplasmin and Coccidioidin Sensitivity in Norway. J. Böe, V. Lindén and J. Tveit.—p. 196.

Histoplasmin and Coccidioidin Sensitivity.—Histoplasmin, coccidioidin, and tuberculin sensitivity tests were done in 1,074 persons, of whom 935 were patients in medical and surgical wards and 139 physicians, nurses, and medical students. Nearly all the patients were afebrile when the tests were performed, and most of the persons examined were adults. Twenty-seven persons had positive results from histoplasmin alone and three from coccidioidin alone. There were 23 persons with positive results from both histoplasmin and coccidioidin. None of the 53 positive reactors showed any signs of disease of the lungs or other disease that could be associated with a mycotic infection. Fifty of these 53 persons also had positive results from tuberculin. Consequently, systematic examinations for pulmonary calcifications were omitted as not likely to be instructive. The three persons who were observed to be tuberculin-negative and mycotic antigen-positive showed no pulmonary calcifications. There are reasons for believing that some of the positive reactions to histoplasmin were caused by past or present infections with Histoplasma capsulatum. One of the three persons with a positive reaction to coccidioidin alone had spent some time in Southern California and thus could have been infected with coccidioidomycosis. The relatively large number of persons with positive reaction to both histoplasmin and coccidioidin indicates that in these cases the positive reactions must be regarded as cross reactions due to systemic infections with one or more unknown fungi immunologically closely related, possibly Geotrichum. It seems probable that one or several systemic fungous infections occur in Norway and that they give positive reactions to both histoplasmin and coccidioidin.

Arch. Chirurg. Ortoped. e Medicina, Milan

16:3-64 (Jan.-Feb.) 1951. Partial Index

*Report on Immediate Results of Experiment on BCG Vaccination Against Tuberculosis. P. Cattaneo and R. Scotti Douglas.—p. 3.
*Clinical Considerations in a Case of Tuberculosis of Pubis. A. Amadei.—p. 52.

BCG Vaccination in Children.—Cattaneo and Scotti Douglas observed 633 children of both sexes between the ages of 4 and 14 yr. with a negative Wollmer test. The children were observed for three months in a municipal sanatorium located at high altitude in Italy in three approximately equal groups. Twenty-seven children of the first group, 40 of the second, and 39 of the third had had contact with tuberculosis in their homes. Roentgenographic examination of the thorax showed early tuberculous lesions in 72 children (11%). The tuberculin tests were repeated at monthly intervals before and after vaccination. The Wollmer test was used exclusively with the children of the first group, and the Mantoux test was used with those of the second and third groups. BCG vaccination was performed only in 556 children, 77 children being excluded because they had febrile intercurrent diseases before vaccination or because they had a 3+ reaction to the Mantoux test. The focus of reaction to vaccination was acute in 250 children (45%), mild in 15 (2.7%), and moderate in the rest. The tuberculin tests performed one month after vaccination gave positive results in 11.82% of the children in the first group (Wollmer) and 94.9% in the children of the second and third groups (Mantoux). It was observed that the positivity of the postvaccinal tuberculin tests and the improvement of health of the children after vaccination were directly related to the extent of the reaction of the focus of BCG vaccination.

Tuberculosis of Pubic Bone.—Tuberculosis of the pubic bone is rare. Clinical diagnosis is difficult; however, in most cases the roentgen picture of the pubic bone is clear and characteristic of the disease, showing a pubic symphysis with irregular borders and decalcification of the pubic bone. The author discusses the clinical course and treatment of the various forms of tuberculosis of the pubic bones, namely, (1) early closed forms, (2) tuberculous abscess without fistula, (3) tuberculous fistula, either with or without sequestrums, and (4) great destruction of the pubic bone in cases of long duration. The surgical treatment in cases of tuberculosis with caries of the pubic bones with fistulas and multiple tuberculous abscesses consists of removal of the segments of the carious bone and scraping of the carious foci. The abscesses permanently regress, and the fistulas heal after operation. Orthopedic-surgical treatment with use of Blair's or other types of arthrodesis is indicated in cases with severe static and dynamic disorders from severe loss of bone due to tuberculosis. The author reports a case in a woman of 23 in whom the presence of a hard and elastic swelling in the suprapubic region led to an erroneous diagnosis of either encapsulated hematoma or desmoid tumor. A roentgenogram showed tuberculosis of the pubic bones. Multiple tuberculous abscesses and a tuberculous fistula were present. Cure was effected by surgical treatment consisting of removal of sequestrums and scraping of carious bones.

Biochemical Journal, London

48:385-512 (April) 1951. Partial Index

Studies on Metabolism of Semen: VII. Cytochrome in Human Spermatozoa. T. Mann.—p. 386.
Isolated Nuclei from Cells of Cerebral Cortex: Preparation and Enzyme Content. D. Richter and R. P. Hullin.—p. 406.
Virulence-Enhancing Factor of Mucins: III. Further Fractionation of Hog Gastric Mucin; Additional Factor in Adjuvant Action. H. Smith.—p. 441.
Biochemistry of Fluoroacetate Poisoning: Isolation of Active Tricarboxylic Acid Fraction from Poisoned Kidney Homogenates. P. Buffa, R. A. Peters and R. W. Wakelin.—p. 467.
Separation and Identification of Small Amounts of Mixed Amino Sugars. E. F. Annison, A. T. James and W. T. J. Morgan.—p. 477.
Enzymes of Carbohydrate Metabolism in Neurospora: I. Succinic Dehydrogenase. C. J. Shepherd.—p. 483.
Removal of Acid by Trioctylamine from Samples for Microbiological Assay. D. E. Hughes and D. H. Williamson.—p. 487.
Re-Investigation of Question of Activators of Carbonic Anhydrase. A. M. Clark and D. D. Perrin.—p. 495.

British Heart Journal, London

13:129-272 (April) 1951

Development of Conducting System in Heart of Sheep. E. J. Field.—p. 129.
Congenital Absence of Right Branch of Bundle of His. J. B. Coakley.—p. 148.
Phonocardiogram of Aortic Stenosis. A. Leatham.—p. 153.
Electrocardiogram Associated with Low Levels of Serum Potassium. P. M. McAllen.—p. 159.
Cold and Warmth Vasoconstrictor Responses in Skin of Man. J. Grayson.—p. 167.
Nutritional Heart Disease. A. D. Gillanders.—p. 177.
First Effort Angina: Second Wind in Angina Pectoris. R. K. Price.—p. 197.
Electrocardiographic Studies During Operation for Coarctation of Aorta. M. M. Alimurung and R. M. Smith.—p. 203.
Splenic Enlargement in Congestive Heart Failure and Active Rheumatic Infection. M. Ibrahim, A. Sorour and A. Elsherif.—p. 212.
Prodromal Symptoms in Myocardial Infarction. P. Mounsey.—p. 215.
Measurement of Blood Flow by Local Clearance of Radioactive Sodium. H. Miller and G. M. Wilson.—p. 227.
Vectorcardiogram in 100 Healthy Subjects Using New Drawing Instrument. J. Shillingford and W. Brigden.—p. 233.
New Angiocardiographic Sign of Patent Ductus Arteriosus. R. H. Goetz.—p. 242.
Actinomyces Muris Endocarditis Treated with Chloramphenicol. J. F. Stokes, I. R. Gray and E. J. Stokes.—p. 247.

British Journal of Venereal Diseases, London

27:1-48 (March) 1951

World Health and Treponematoses. T. Guthe and F. Reynolds.—p. 1.
Late Syphilis of Liver Treated with Penicillin. C. S. Nicol and R. B. Terry.—p. 20.
Cardiolipin Antigen: I. Qualitative Examination of Sensitivity and Specificity. H. Schmidt.—p. 23.

An asterisk (*) before a title indicates that the article is abstracted. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1:773-832 (April 14) 1951

Paralysis of Autonomic Ganglia, with Special Reference to Therapeutic Effects of Ganglion-Blocking Drugs. W. D. M. Paton.—p. 773.
*Methonium Compounds in Treatment of Hypertension. S. Locket, P. G. Swann and W. S. M. Grieve.—p. 778.
Acute Leukaemia Treated with A-Methopterin. J. V. Dacie, E. Dresner, D. L. Mollin and J. C. White.—p. 784.
Tuberculous Meningitis: Results of Treatment with Streptomycin and Intrathecal Sulphetrone. W. L. Calnan, J. Rubie and A. F. Mohun. —p. 792.
*Tuberculous Meningitis Treated with Streptomycin: Follow-Up of Survivors for Minimum of Two and a Half Years. W. L. Calnan, J. Rubie and A. F. Mohun.—p. 794.
Orf in London. I. S. Hodgson-Jones.—p. 795.
Radical Cure of Inguinal and Femoral Hernia with Polythene Insert. W. Thompson.—p. 797.

1:833-898 (April 21) 1951

Degeneration, Necrosis, and Fibrosis in Liver. J. H. Dibie.—p. 833.
Cortisone in Treatment of Toxaemia of Pregnancy: Study of Eight Cases. H. Moore, W. J. E. Jessop, D. K. O'Donovan and others.—p. 841.
Post-Traumatic Disturbance of Hypothalamic Function. E. A. J. Byrne. —p. 850.
Prevention of Hormonal Eosinopenia and Lymphopenia by Inhibition of Clotting in Blood: Preliminary Report. Z. Z. Godlowski.—p. 854.
Pathogenesis of Mitral Stenosis. F. R. Magarey.—p. 856.
Use of Gallamine Triethiodide (Flaxedil) in Modifying E. C. T.: Comparison With d-Tubocurarine Chloride and Decamethonium Iodine. O. S. Thompson and A. Norton.—p. 857.
Gallamine Thriethiodide as Adjunct to Electroplexy. R. H. F. Smith and D. L. C. Thomas.—p. 860.
Sternal Marrow Cultures in Typhoid Fever. L. Hirsowitz and R. Cassel. —p. 862.

Methonium Compounds in Hypertension.—Thirty-four patients with essential hypertension were given a therapeutic trial with pentamethonium bromide or hexamethonium bromide. Women predominated in a ratio of 2 to 1. Before treatment each patient was given two weeks' control period of observation, routine treatment, and bed rest. Initially the methonium compounds were given intramuscularly in doses of 25 mg. to 150 mg. at intervals of two to six hours, depending on the response of the patient. After two weeks the drugs were given by mouth in doses of 500 to 1,000 mg. of pentamethonium bromide every four or six hours, or 250 to 500 mg. of hexamethonium bromide given eventually as frequently as every two hours. After 24 to 72 hr. of oral treatment the patient was allowed to get out of bed. After they were discharged from the hospital the patients continued to take more than 3 gm. of hexamethonium or pentamethonium bromide daily in divided doses at two or three hour intervals. In every case the methonium compounds were hardly more effective in lowering the blood pressure than the initial period of bed rest. Follow-up of these patients showed a complete failure of the drugs to lower or maintain a low blood pressure when orally administered. One patient with malignant hypertension became unconscious within 15 min. after intramuscular injection of 25 mg. of pentamethonium bromide and died two hours later. There were three probable cases of bromide intoxication. Although methonium compounds given intramuscularly produced an acute drop in blood pressure when the systolic pressure exceeded 200 mm. of mercury, the effect did not last. Almost all patients who continued taking the drug claimed partial or complete relief of many of their symptoms, such as headache, dyspnea, or vertigo, even in the absence of any appreciable fall in their blood pressure or objective improvement. It is believed that the sedative effect of the bromide ion, aided by ancillary factors, was one of the main agents in the subjective improvement of these patients. Since the methonium compounds are not harmless and produce results no better than bed rest, there is no indication that they should be used at all outside of the hospital. The therapeutic value of these drugs in the long-term treatment of hypertension should not be assessed by their known ability to produce an acute fall in blood pressure.

Streptomycin in Tuberculous Meningitis.—Of 54 patients with tuberculous meningitis treated with streptomycin during the period of July 1947 to May 1948, 18 survived and were followed up for two and a half to three and a half years. Two of the 18 original survivors died, reducing the survival rate to 30%. Three patients relapsed but recovered after further treatment with streptomycin. Sequelae shown by the survivors were deafness in two children, minimal hemiplegia in one child, retarded development in one, and an intellectual defect in one. Audiometric and vestibular tests were carried out on 14 of the 16 survivors. All showed complete loss of vestibular response during caloric tests, yet none showed clinical ataxia in a good light. Some patients were slightly ataxic with the eyes closed or in the dark. Audiometric tests revealed a pronounced hearing loss in one patient and a loss up to 50 db. in another. In the remainder the audiograms were normal. Later manifestations of nonmeningeal tuberculosis, presumably due to sporadic hematogenous dissemination of tubercle bacilli, occurred in two recovered patients. The nonmeningeal lesions of these patients responded to treatment and were not accompanied by any evidence of recrudescence of meningitis. Slight variations in the cerebrospinal fluid of the survivors were observed, but their significance could not be determined. The authors do not regard a patient as finally cured even two and a half years after streptomycin treatment. A further, undetermined period of observation is necessary.

Canadian Medical Association Journal, Montreal

64:285-386 (April) 1951

Poisonings Common in Children. J. R. Ross and A. Brown.—p. 285.
*Treatment of Pulmonary Tuberculosis with Thiosemicarbazones. S. J. Shane, C. Riley, J. H. Laurie and M. Boutilier.—p. 289.
Pathogenesis of Eczema. F. E. Cormia.—p. 293.
Anaesthetic Complications and Their Management. I. W. Mann.—p. 302.
Pseudocyesis. D. D. Kulcsar.—p. 305.
Studies on Poliomyelitis in Ontario: IV. Further Observations on Spread of Poliomyelitis and Coxsackie Infections in Small Communities. N. Silverthorne, M. P. Armstrong, A. M. Goodfellow and others. —p. 309.
Fulminating Diffuse Phlegmonous Gastritis. J. D. Stenstrom and G. H. Hoehn.—p. 317.
Surgical View of Thrombosis and the Anti-Thrombotics. R. M. Janes. —p. 319.
Experiences with Lung Resection in Pulmonary Tuberculosis (Review of 60 Cases). V. D. Schaffner, J. J. Quinlan and J. E. Hiltz.—p. 326.
Treatment of Detached Retinae. H. M. Macrae.—p. 335.
Age and Sex Differences in Serum Cholesterol of Aleut. S. M. Garn and M. M. Gertler.—p. 338.

Thiosemicarbazones in Tuberculosis.—Sixteen male and nine female patients, 14 with moderately advanced and 11 with far advanced pulmonary tuberculosis, were treated with amithiozone ("contibiol"). Treatment was planned to continue for three months. Each patient received a daily dose of 50 mg. for the first week, 100 mg. for the second week, and 200 mg. for the remainder of the course. Of the 25 patients, only 17 were able to complete the course, because of subjective toxic symptoms in four patients, of roentgenologic evidence of extension in two, and severe neutropenia in two. In three of the patients with subjective toxic symptoms an attempt was made to continue treatment by a reduction in the daily dose to 100 mg., but even this reduced dose was not tolerated. Only three of the 25 patients gained weight during treatment, the rest lost weight in amounts varying from five to 17 lb. (2.3 to 7.7 kg.). Ten patients showed roentgenologic improvement at the end of the study. The changes consisted of some measure of resolution of the exudative component, similar to those noted with paraaminosalicylic acid. In four of 20 patients with sputum positive for tubercle bacilli at the beginning of the treatment, the sputum became negative, but in 16 tubercle bacilli were still demonstrated at the end of the course. All patients felt some degree of malaise during treatment, and all felt better when the drug was discontinued. Twenty-two patients complained of nausea, 15 of vomiting, two of diarrhea, and two of headache. Twelve patients had drug fever, that is, a persistent elevation of temperature to 99.5 F. Sixteen patients had less striking manifestations, including chills, watering of the eyes, periorbital edema, pruritus, and enlargement of cervical lymph nodes. Six patients had significant proteinuria, presumably indicating some degree of renal irritation. Anemia occurred in five patients, all of whom had a normal blood picture at the start of the treatment. In two patients almost complete neutropenia developed. Because of the equivocal therapeutic results and the toxic effects, the authors believe that the drug has no advantage over other therapeutic agents, such as streptomycin and paraaminosalicylic acid, and that it is too toxic for general use. If used at all, it requires more stringent laboratory supervision than is usually available.

Chirurg, Heidelberg

22:145-192 (April) 1951. Partial Index

*Pathogenesis of Multiple Glomus Tumors. H. Oberdalhoff and W. Schütz.—p. 145.
Functional Treatment of Posttraumatic Disturbances of Circulation and of Other Congestive Disorders in Leg and Foot. H. J. von Brandis and J. Schilling.—p. 149.
Further Progress in Treatment of Thromboembolism with Anticoagulants. R. Johow and H. A. Thies.—p. 153.

Pathogenesis of Multiple Glomus Tumors.—A girl 13 is reported on who since her early childhood had had a developmental defect of the right arm resulting in extensive functional disturbance of the right hand. Peculiar features of the disease process were the occurrence of multiple painful glomus tumors on the right forearm and hand, varying in size from that of a bean to that of a dove's egg; pronounced weakness and atrophy of the muscles of the right upper arm and forearm; isolated hyperhidrosis in the involved forearm and fingers; hypoplasia and chronic osteoporosis of the bones of the forearm and of the hand, with precocious bony closure of the epiphyseal lines; pronounced brachymetacarpia of the fourth and fifth finger. The predominant multiple glomus tumors were histologically of the angiomatous type. An intrinsic relationship is suggested between the glomus tumors and the local disturbance of bone growth, for which the term "glomangiomatous-osseous malformation" has been coined. The mesenchymal tissue, especially the glomus and bone tissues, may be considered as primarily affected by the local degeneration. This new congenital developmental disturbance is similar to other congenital systemic diseases, such as systemic hemangioma and neurofibromatosis (von Recklinghausen's disease). Consequently, the isolated occurrence of multiple glomus tumors in the absence of any other malformation may be a congenital disturbance of development of the glomi of blastomatous type rather than genuine blastoma. "Glomoblastosis," therefore, seems to be a more exact term for multiple glomus tumors.

Deutsche medizinische Wochenschrift, Stuttgart

76:389-432 (March 30) 1951. Partial Index

Resection of Cardiac Portion of Stomach. H. Krauss.—p. 389
Remarks on Modern Development of Surgery. E. von Redwitz.—p. 391.
Injuries of Tissues Due to Talcum. R. Rössle.—p. 394.
*Effect of Transplantation of Hypophysis on Regulation of Carbohydrate Metabolism. H. zur Horst-Meyer.—p. 401.

Hypophysis and Regulation of Carbohydrate Metabolism.—The relation of the hypophysis to the hypothalamic center that regulates carbohydrate metabolism was investigated in 36 patients (nine men and 27 women) with definite symptoms of diencephalohypophysial disturbance. Approximately half of these patients had a disturbance of the carbohydrate metabolism. It was characterized in two patients by the failure of the blood sugar level to rise normally after a single oral dose of dextrose. In all patients there was a greater elevation of the blood sugar level after the second than after the first dose of dextrose. The terminal blood sugar values two hours after the second dose of dextrose were higher than the initial values. This absence of immediate hyperglycemia after the administration of dextrose, as well as the suppression of the compensatory hypoglycemic mechanism, occurred in the same percentage of men as of women. These patients were given intramuscular injections with pulverized anterior pituitary lobes from calves, suspended in isotonic sodium chloride solution. The first changes in the blood sugar curve were observed within one to three weeks after these injections. In the two patients whose blood sugar level was not previously elevated after the first dose of dextrose a normal elevation now occurred. An increased counterreaction was observed in all patients: the increase in the elevation of the blood sugar level after the second dose of dextrose did not exceed that after the first dose, and the terminal values were the same as the initial values. A definite explanation for this activation of the counter regulation cannot yet be given. It is suggested that the agent responsible may be liberated with the absorption of the injected hypophysial tissue. An inflammatory infiltration around the area of injection may prevent its effect. The natural agent was absent in the author's patients but could be replaced by the injection of the animal hypophysial tissue. Thus there appears to be a fundamental difference between the therapeutic effect of hypophysial tissue and extracts of anterior pituitary lobe. The latter is known to have an anti-insulin effect.

Helvetica Medica Acta, Basel

18:69-158 (April) 1951. Partial Index

Study of Renal Diabetes: I. Mechanism of Glycosuria. F. Reubi.—p. 69.
Studies of Adenosine Triphosphate and Its Therapeutic Applications. I. Report: Pharmacologic Study. H. Dubois-Ferrière.—p. 84.
Behavior of "Ventricular Gradient" in Changes of Electrocardiogram Due to Neurovegetative Disturbances. A. Kappert, V. de Fazio and F. Marsico.—p. 109.
*Pentolysis: Its Application to Diagnosis of Cancer. G. Menkès.—p. 125.

Pentolysis in Diagnosis of Cancer.—Preliminary experiments showed that the serums of patients with various acute or chronic noncancerous diseases, such as tuberculosis, fibromas, and benign tumors, cirrhosis of the liver, and diabetes mellitus had little or no effect on pentoses that had been added to these serums. On the contrary, dry pentoses added to the serums of patients with cancer were disintegrated by these serums, and lactic acid and glycolic aldehyde were produced. Graphs of the effect of cancerous serums on the pentoses were studied and proved to be typical of an enzymatic action. Additional experiments demonstrated that the addition of serum of normal persons to that of the cancerous patients inhibits the pentolysis. The serums of persons with infectious diseases occasionally exerted a pentolytic effect that could not be inhibited by the addition of serums of normal persons. This effect may be ascribed to the action of bacteria or of their dissolution products. When cancerogenic injections were given to rats, blood withdrawn from these animals by intracardiac puncture definitely showed pentolysis 30 days after the injection, while necropsy of the animals killed revealed no tumor. It is suggested that pentolysis is a precocious reaction that occurs before any tumor has had time to develop. Four hundred and sixty-two blood tests were performed on 399 patients with cancer or other diseases, including those patients on whom the preliminary tests were performed. A positive pentolytic reaction to these tests confirming the diagnosis was observed in 414 instances. The enzymatic nature of the phenomenon is stressed.

Lancet, London

1:753-806 (April 7) 1951

Psychiatric Aspects of Organic Disease. J. W. Todd.—p. 753.
Treatment of Fractures in the Aged. C. Flemming.—p. 758.
Cortisone in Acute Lymphoblastic Leukaemia: Report of Case. M. M. Suzman, B. Goldberg and H. Hirsch.—p. 760.
*Chloramphenicol in Treatment of Pertussis: Review of 100 Cases. H. C. A. Lassen and L. C. Grandjean.—p. 763.
*Modification of Whooping-Cough in Contacts by Means of Chloramphenicol. A. Bogdan.—p. 764.
Indigenous Amoebiasis in Britain. T. C. Morton, R. A. Neal and M. Sage.—p. 766.
Fulminating Sonne Dysentery in Children. I. C. Lewis and A. E. Claireaux.—p. 769.
Acetylsalicylic Acid and Urinary Excretion of Adrenocortical Steroids. H. Van Cauwenberge and C. Heusghem.—p. 771.
Salicylate, Gentisate, and Circulating Eosinophils. B. W. Meade and M. J. H. Smith.—p. 773.
Use of Penicillin and Sulphonamides in Treatment of Suppuration. M. Ellis.—p. 774.
Measurement of Digital Swelling in Rheumatoid Arthritis. F. D. Hart and C. J. M. Clark.—p. 775.

Chloramphenicol in Pertussis.—Ninety-seven infants and children and three adults with whooping cough were treated with chloramphenicol (chloromycetin®). All these patients showed the characteristic clinical picture of the disease, and in 80 of them the diagnosis was confirmed by the cultivation of Hemophilus pertussis. In 93 patients the chloramphenicol was administered rectally in suppositories, whereas the seven older children and the adults were given the drug orally in capsules. Treatment was continued for three to five days. Most of the patients were in the first two or three weeks of the disease. Repeated nasopharyngeal cultures were examined in every case. Of the 80 patients with positive cultures before treatment, 73 had negative cultures within nine days of the institution of the treatment with chloramphenicol. The frequency of the paroxysms fell sharply, and the patients' general condition improved rapidly. The results obtained with the conventional cough-plate method were compared with those of swab cultures from the nasopharynx on the same mediums. The swab cultures gave a much higher percentage of positive results than the cough plates; swab culture was therefore adopted as the routine method of diagnosis. Of 45 strains of H. pertussis in which the in vitro resistance to chloramphenicol was estimated, all were observed to have a low resistance. Chloramphenicol seems to be the most effective drug so far tried in whooping cough. It should be used in every case of pertussis in infants.

Suppressive Treatment of Whooping Cough With Chloramphenicol in Contacts.—Thirteen children who were susceptible contacts of known cases of whooping cough and were in the preparoxysmal stage were treated with chloramphenicol (chloromycetin®). The daily dose was 22 mg. per kilogram of body weight, except for one patient who was given 33 mg. per kilogram of body weight. The drug was given mixed with jam or milk by mouth in five divided doses daily for five days. In 10 of the 13 contacts the disease was arrested in the preparoxysmal stage. In three of the four patients reported on in detail infectivity appeared to be pronouncedly curtailed. The protection given is immediate in contrast with that provided by vaccines, which takes some weeks to develop. A recurrence was observed two weeks later in one patient, and reinfection occurred in another patient after two months, suggesting that when the disease is arrested by chloramphenicol in the preparoxysmal stage it may not be followed by immunity. During the same period 63 children with whooping cough not treated in the preparoxysmal stage served as controls. A severe paroxysmal cough was reported in 14, and 45 were whooping. In only four patients did the cough not cause severe distress. The use of chloramphenicol in the preparoxysmal stage might be valuable in reducing the mortality and morbidity of whooping cough and in controlling the infection.

Medical Journal of Australia, Sydney

1:353-388 (March 10) 1951

*Pink Disease: Manifestation in Older Children and Estimation of Blood Adrenaline Content. D. B. Cheek.—p. 353.
*Pink Disease: Its Relation to Adrenal Function and Value of Salt and Desoxycorticosterone in Treatment. H. Williams, W. B. Macdonald and V. Callow.—p. 363.
Note on Placenta-Permeating Anti-M Agglutinin. R. Jakobowicz and L. M. Bryce.—p. 365.
Cerebral Tumour: Early Symptoms and Methods of Investigation. J. Game.—p. 367.
Use of Di-Hydro-Ergotamine in Obstetrics. R. C. Gill.—p. 373.

1:389-424 (March 17) 1951

Measurement of Mortality in Australia. H. O. Lancaster.—p. 389.
Problem of Thoracic Stomach. A. W. Morrow.—p. 399.
Lobectomy for Hydatid Disease of Lung. M. P. Susman.—p. 400.
Heparin Protamine Test and Its Clinical Significance. N. M. Gutteridge.—p. 403.

1:425-460 (March 24) 1951

Blood, Taste and Secretion: Genetical Survey in Maoris. R. T. Simmons, J. J. Graydon, N. M. Semple and C. N. D. Taylor.—p. 425.
Management of Bronchiectasis. H. Windsor.—p. 431.
Mantoux and Tuberculin Jelly Test Survey at Princess Margaret Hospital for Children, Perth, Western Australia. J. Margolis.—p. 433.
Urological Emergencies. A. Gee.—p. 436.

1:461-496 (March 31) 1951

Primitive Medical Art and Primitive Medicine-Men of Australia. L. P. Winterbotham.—p. 461.
Biochemical Aids in Diagnosis of Deficiency of Vitamin B Complex. J. B. Cleland.—p. 468.
Psychosomatic Aspect of Skin Diseases. W. K. Myers.—p. 476.
Psychosomatic Aspects of Dermatology. J. D. Russell.—p. 478.
Notes on Erysipeloid of Rosenbach. P. H. Speight.—p. 480.

Pink Disease in Older Children.—Cheek believes that pink disease (acrodynia) may be a manifestation of adrenal dysfunction either primary or secondary to renal disturbances. He found low levels of plasma sodium and urinary chlorides in his acute cases and observed that these abnormalities persisted in some children who were under stress after the typical symptoms of photophobia, hyperhidrosis, irritability, swelling and redness of the hands and feet, and skin rashes had disappeared. Eleven such children between the ages of 2 and 7 years showed the syndrome of the nervous child and exhibited allergic manifestations with eosinophilia. Recovery followed the administration of sodium chloride alone in the mild cases (plasma sodium level 300 mg. per 100 cc.) and followed the administration of 5 mg. of desoxycorticosterone daily in the severe cases. Salt alone did not restore normal osmotic relationships in most cases. There was no abnormality of the blood epinephrine content in 18 children with pink disease. The author speculates that some toxic or photodynamic agent may injure the renal tubules in this disease, altering electrolyte excretion and placing a strain on the adrenal because of its role in maintaining homeostasis.

Role of Adrenal in Pink Disease.—Williams and co-workers found no constant or significant disturbance of the serum sodium content of 22 patients with pink disease (acrodynia) as compared with 22 normal children of the same age, although two patients had a low serum sodium level. The hematocrit, hemoglobin, and protein values were raised, and the serum chloride level was lowered in pink disease, but the mechanism of these changes was not clear. There was no evidence of hypofunction of the adrenal gland as determined by studies of blood sodium and potassium levels and 11-oxysteroid excretion in the urine. A controlled clinical experiment on 10 selected patients failed to show any really significant difference in the recovery rate of the five treated with salt and desoxycorticosterone as compared with those who did not receive this treatment.

Minerva Medica, Turin

42:169-196 (Suppl. to Jan. 27) 1951. Partial Index

*Exceptional Case of Resuscitation Obtained with Intracarotid Blood Transfusion Directed Toward Brain. A. Costantini, G. Dei Poli, E. Ciocatto and L. Caldarola.—p. 184.
Twelve Cases of Nonspecific Inflammatory Articular Lesions Treated According to Lewin and Wassen Technique. L. Benacchio.—p. 192.

Resuscitation by Intracarotid Blood Transfusion.—The authors discuss the method of intracarotid blood transfusion directed toward the brain for resuscitation of human beings. The transfusion is made through the common carotid artery. This method is based on results of a large number of experiments in animals; its purpose is to supply the brain with blood more rapidly than is possible with intraarterial blood transfusion directed toward the heart. An exceptional case of resuscitation effected by this new method is reported. A woman, 53, with neoplasm of the pancreas showed signs of grave intolerance followed by collapse during the preoperatory segmental peridural anesthesia. Administration of the common analeptics, of oxygen through the trachea, and of an intracardial injection of 1 cc. of a 1% epinephrine solution failed. There was no sign of life, and the patient was pronounced dead. Thirty minutes later intracarotid blood transfusion toward the brain was effected. The common carotid artery was empty and pulseless before transfusion, which was given in doses of 50 cc. of citrated blood of group O every 10 min., up to a total quantity of 400 cc. of blood. Resuscitation was effected by this means for the first time in man. Cardiac pulsations and respirations were resumed, and blood pressure returned to normal. However, the patient was comatose and paralyzed, and after 25 hours she died. The authors believe that intracarotid blood transfusion is the therapy of choice in such cases and should be preferred even to massage of the heart.

Nordisk Medicin, Stockholm

45:383-424 (March 14) 1951

*Adrenocortical Activity and Immunity. M. Bjørneboe.—p. 383.
*Hypopotassemia. M. Osnes.—p. 387.
Herberden's Nodes. Follow-Up of Women After Roentgen Castration. O. Sylvest and N. Jarløv.—p. 391.
Sensitization to Etolein. T. Hendelberg.—p. 394.
Surgical Treatment of Mastitis During Lactation. A. Sjövall.—p. 397.

Adrenocortical Activity and Immunity.—Bjørneboe reviews experiments concerning the effect of cortisone and corticotrophin (ACTH) on the concentration of circulating antibodies. To explain the beneficial effect of adrenocortical hormones in human diseases the following hypothesis is proposed: In diseases where antibody formation is injurious, substances that inhibit antibody formation, i. e., adrenocortical hormones, will be effective. In infectious diseases in which the course clearly shows the prognosis to depend on the ability of the organism to form antibodies, adrenocortical hormones will not be effective.

Hypopotassemia.—Osnes discusses three cases of certain hypopotassemia, one case of probable intracellular potassium deficiency, and a fifth case of probable hypopotassemia, in which the pathological-anatomic changes in the heart resemble those described in the literature. In the first two cases, with diarrhea, the hypopotassemia is attributed to dehydration and increased potassium loss in the feces; in the third, with chronic nephritis, the increased loss of potassium via the kidneys is ascribed to the nephritis. The fourth case, with alkalosis, illustrates the significance of potassium in the acid-base equilibrium. In all cases there was disturbance in the intracellular metabolism. Electrocardiographic changes led to the examination of the potassium values in the serum. These changes—prolonged Q-T interval, flattened to negative T waves, prominent U waves and falling S-T segments—all testify to hypopotassemia. The ventricular extrasystoles that were demonstrated in the third case and disappeared after potassium therapy may have been due to the hypopotassemia. Possible shock should first be counteracted.

45:425-460 (March 21) 1951. Partial Index

Surgical Treatment of Cancer of Esophagus. T. Wilkund.—p. 425.
*Obstetrical Considerations in Essential Hypertension. G. Nordenstrahl.—p. 433.
Tendency to Hemorrhage and Renal Insufficiency on Antihistamine Medication (Desentol) During Pregnancy. S. Lundin.—p. 436.
Tuberculous Meningitis During Pregnancy. E. Rutberg.—p. 437.
Perforation of Alimentary Canal by Fish Bones. S. Engquist.—p. 439.
Primary Pulmonary Sarcoma. H. Nilsson.—p. 440.

Obstetrical Considerations in Essential Hypertension.—Nordenstrahl says that in essential hypertension it is sometimes difficult during pregnancy to differentiate between hypertension, hypertension with superimposed toxicosis, and early simple toxicosis. The effect of hypertension in pregnancy is mainly threefold: intrauterine death is frequent, the infant's weight is less than the weight corresponding to the duration of the pregnancy, and there is definite danger of toxicosis. With blood pressure of 160/100 or more during the first half of pregnancy, renal function tests should be made; if filtration is reduced the pregnancy can be allowed to continue only under the strictest control. Blood pressure increase to 150 or 160 during pregnancy requires only weekly observation from the sixth month on. When the blood pressure is over 170/95 during the later part of pregnancy the critical period for fetal death is between the fifth and fourth week before parturition. For delivery of a living child birth should be induced by rupture of the membrane in multiparas and cesarian section should be done in older primiparas. If bed rest and other treatment can bring the blood pressure down to 170/100, natural delivery may be awaited, but hospital care during the last six weeks is necessary. Prophylactic vitamin C and vitamin D medication in all cases of essential hypertension is believed to be important if given in sufficiently large doses to reduce the fragility of the blood vessels and the tendency to premature separation of the placenta.

Policlinico (Surg. Sect.), Rome

58:1-64 (Jan.-Feb.) 1951. Partial Index

*Unusual Form of Surgical Splenomegaly: Anatomicoclinical Definition and Interpretation of Giant Follicular Splenomegaly. L. Tonelli.—p. 1.

Giant Follicular Splenomegaly.—According to Tonelli this disease is an unusual form of splenomegaly in which splenectomy is indicated. The symptoms are similar to those of Banti's syndrome. The spleen is greatly enlarged. The author performed splenectomy on two patients in whom the clinical course and the type of follicular hyperplasia were typical of giant follicular splenomegaly (Ferrata-Introzzi). Both patients had moderate hypochromic anemia. One had leukopenia with lymphocytosis. Giant follicular hyperplasia was restricted to the spleen and a supernumerary spleen in one case and to the spleen and the splenic and pancreatic lymph nodes in the other case. One of the patients died from bronchopneumonia 22 days after the operation. All the lymph nodes were found to be normal at necropsy. The patient with the splenolymphonodular form of the disease is in good health up to now, more than two years after splenectomy. The author believes that giant follicular splenomegaly is the pure splenic form of follicular lymphoblastoma (Brill-Symmer's disease). It is rare and malignant. The mixed splenic and lymphonodular form and the pure lymphonodular form of the disease are frequent, and their malignancy is similar to that of the pure splenic form. Survival for more than eight years after splenectomy has been reported in rare instances. Sooner or later the disease progresses into a malignant form, the early characteristics of the disease remaining or changing into lymphosarcoma, lymphadenosis or lymphogranulomatosis (Sternberg's lymphogranuloma). Therefore, roentgen treatment should follow splenectomy in all cases.

Practitioner, London

166:311-424 (April) 1951

Chemotherapy in Pneumonia and Bronchitis. A. B. Taylor.—p. 315.
Chemotherapy in Exanthemas. H. S. Banks.—p. 321.
Value of Chemotherapy in Surgery. E. C. B. Butler.—p. 326.
Chemotherapy of Purulent Meningitis. H. V. Smith.—p. 334.
Chemotherapy of Dermatology. G. A. Grant Peterkin.—p. 344.
Chemotherapy in Ophthalmology. J. H. Doggart.—p. 349.
Chemotherapy of Venereal Diseases. C. S. Nicol.—p. 353.
Chemotherapy in Intestinal Infections. W. H. Hargreaves.—p. 361.
Chemotherapy in Tropical Diseases. J. S. K. Boyd.—p. 366.
Chemotherapy in Leprosy. R. G. Cochrane.—p. 373.
Toxic Effects of Chemotherapeutic Agents. F. Hawking.—p. 382.

Prensa Médica Argentina, Buenos Aires

38:815-858 (April 6) 1951. Partial Index

*The Management of Patients with Multiple Sclerosis. B. B. Spota and D. Brage.—p. 815.

Treatment of Multiple Sclerosis.—Spota and Brage review the various theories on etiology of multiple sclerosis and the unsuccessful therapeutic methods used up to now. They suggest that multiple sclerosis is a syndrome of lack of adaptation of the nervous system in persons with reticuloendothelial mesenchymal disease. The authors treated multiple sclerosis with small doses of desoxycorticosterone acetate combined with large doses of ascorbic acid, and they obtained gratifying results from early therapy. They stress the importance of protecting the mesenchyme and avoiding the use of drugs that may injure or destroy it, since multiple sclerosis itself produces demyelinization and microglial reaction. Cortisone therapy for the treatment of multiple sclerosis is suggested by the authors, who have some experiments in process, although they make no definite conclusions. Exact doses used by the authors are not specified.

Presse Médicale, Paris

59:517-536 (April 18) 1951

*Study of Thermal Coagulation Test of Serum Proteins in 398 Cases: Its Diagnostic Value in Cancer, Malignant Hemopathies and Tuberculosis. A. Tzanck and J. P. Soulier.—p. 517.
Risk Associated with Deep Needle Puncture Procedures in Course of Anticoagulant Therapy: Massive Retroperitoneal Hemorrhage from Lumbar Sympathetic Block. J. J. Welti and R. Breynaert.—p. 518.

Diagnostic Value of Thermal Coagulation Tests of Serum Proteins.—Thermal coagulation tests of serum proteins were performed on 164 normal persons, on 89 patients with cancer, on 92 with hemopathies, on 36 with tuberculosis, and on 17 with other diseases. Huggins' method of determining the iodoacetate index as related to the total protein content of serums was modified by the use of potassium cyanide, another inhibitor of the coagulation of serum proteins, instead of iodoacetate. The new reagent has the disadvantage of being unstable, but it does not cause ocular disturbances or dermatitis of the hands, as iodoacetate does. Negative results were obtained in the normal persons. A qualitative defect in the proteins of the serum was identified by the thermal coagulation tests in 69 (77.5%) of the patients with cancer, but normal results were obtained in 10 cancer patients (11.25%). Pathological results were obtained in 19 of the 36 patients with tuberculosis, in 42 of 77 patients with malignant diseases of the blood, and in seven of the 17 patients with other diseases. Thus the potassium cyanide test as well as Huggins' iodoacetate test is not a reliable biologic diagnostic method for cancer. This test can at best make exclusion of cancer possible, but not even that with certitude. For these reasons the authors believe that these tests should not be accepted as diagnostic methods, especially since the reagents used may cause untoward reactions, may be unstable, or may cause errors in interpretation.

Revista Brasileira de Tuberculose, Rio de Janeiro

18:367-508 (July-Aug.) 1950. **Partial Index**

*Acute Edema of Lung Due to Inhalation of Oxides of Nitrogen. G. Botelho.—p. 371.

Acute Edema of Lung Due to Oxides of Nitrogen.—This is a serious and frequent industrial accident. The commonest lesions are those in the respiratory tract, the type and clinical course of which depend on the particular oxide of nitrogen involved and its concentration, the duration of exposure, and the sensitivity of the victim. Prolonged exposure of workers to various oxides of nitrogen at low concentration causes chronic irritation of the respiratory tract with dyspnea and pain in one or both lungs. Later on, chronic bronchitis, bronchiectasis, emphysema, and bronchiolitis obliterans develop. The roentgen picture is similar to that of pulmonary miliary tuberculosis associated with dilatation of the right side of the heart. Exposure to these gases at higher concentrations causes vertigo with or without loss of consciousness, cough, asphyxia, and a burning sensation in the respiratory tract followed by pulmonary disorders, abundant expectoration of bright red blood, and, frequently, pulmonary edema. The pulmonary disorders may be controlled by treatment or may progress to acute pulmonary edema with death of the patient in one or three days. In rapidly fatal cases the only lesion is acute pulmonary edema. Poisoning of a shock type is due to inhalation of these gases at massive concentration. Death is due to stagnation of blood in the pulmonary vessels and cessation of respiration. The treatment consists of immediate removal of the patient from the contaminated atmosphere, inhalation of oxygen, daily intravenous injections of a dose of 100 or 200 cc. of a 50% hypertonic dextrose solution, and administration of penicillin and mersalyl. Codeine and barbital derivatives should be given as sedatives. Venesection is indicated in cases of acute pulmonary edema. The author reports good results from the aforementioned treatment in two cases of subacute poisoning.

Revista Clínica Española, Madrid

40:287-342 (March 15) 1951. **Partial Index**

*Nitrogen Mustard in Treatment of Psoriasis. J. Gómez Orbaneja.—p. 299.
*Modified Boschi's Treatment of Tetanus. C. Bravo Mateos.—p. 320.

Nitrogen Mustard in Psoriasis.—Gómez Orbaneja administered nitrogen mustard (tris-beta-chloroethylamine hydrochloride) to seven patients with psoriasis of various types and of long duration. The drug was given every other day, in doses of 2.5 mg. to adolescents and of 5 mg. to adults, up to a total of three or five injections. In most cases it was well tolerated. Some patients complained of asthenia, headache, nausea, and vomiting. In one of the patients mucosal lesions developed, which were controlled by blood transfusion. The patients were observed for five months after discontinuation of the treatment. In three patients, cure of skin lesions persisted five months after treatment. In four, apparent cure was followed by a recurrence within two or four months. The recurrent lesions were moderate in three patients and of the same severity as those prior to the treatment in one patient. The author states that nitrogen mustard is the only drug with constant favorable effects on psoriasis. Treatment should be given only to hospitalized patients in whom psoriasis cannot be controlled by topic treatment, since the drug may produce blood changes or other severe toxic effects.

Modified Boschi's Treatment of Tetanus.—Bravo Mateos' modification of Boschi's technique is as follows: (1) lumbar puncture with aspiration of the cerebrospinal fluid until no more fluid can be aspirated and (2) injection of 20 cc. of twice-distilled water through the same needle. One hour later blood serum (in doses not specified by the author) is given subcutaneously and glutealy. The treatment is repeated at intervals of 12 hr. for two or three consecutive days. After every treatment profuse perspiration occurs and great subjective improvement is observed. The author reports cure of four patients with tetanus with the use of this method.

South African Medical Journal, Cape Town

25:265-280 (April 21) 1951. **Partial Index**

Chronic Suppurating Osteitis. S. Shulman.—p. 265.
Nasal Rhinosporidiosis: Report of Case in Natal. A. M. Dick.—p. 270.
*Herpes Zoster of Lower Extremity. A. Shedrow.—p. 271.
Congenital Toxoplasmosis. P. Klenerman.—p. 273.

Herpes Zoster of Lower Extremity.—Herpes zoster involving the lower extremities accounts for only 9% of all cases of this common disease. Three cases involving the lower extremities are reported, one of which had an associated varicella-like eruption. It is not known whether herpes zoster and varicella are caused by the same strain of virus or whether they are due to different strains of a similar virus. Although the same ganglions were involved in all three of the reported cases, the symptoms differed. It is apparent that a severe eruption may accompany a mild inflammatory process and vice versa. Herpes zoster may be symptomatic of pressure on the sensory ganglions, caused by an infiltrative lesion or a new growth such as leukemia or a lymphoblastic process, a tuberculous or syphilitic granuloma, or a metastatic malignant lesion. Latent leukemia should be excluded. Differential blood cell count should be done routinely in every case of herpes zoster. Many cases of this disease are overlooked, especially when the eruption is mild and not diffuse. It is not necessary for a thick outcropping of vesicles to be present before herpes can be diagnosed; a solitary erythematous patch with clinical symptoms is compatible with such a diagnosis.

Wiener klinische Wochenschrift, Vienna

63:265-284 (April 13) 1951. **Partial Index**

Choledocholithiasis and Calculous Disease of Gallbladder: Differences Between the Two Conditions. R. Demel.—p. 265.
*Problem of Conglutinating Activity in Fetal and Infantile Serums. F. Seelich, P. Speiser and P. Elsner.—p. 267.
Toxoplasmosis. E. Cuboni.—p. 272.

Conglutinating Activity in Fetal and Infant Serums.—One hundred and eighty-six cord serums of newborn infants were tested for their ability to conglutinate Rh-positive erythrocytes containing incomplete antibodies. Results confirmed the observations by Wiener and Witebsky that serums of infants born prematurely show the lowest degree of conglutinating activity and that this activity increases with advancing age. Despite the slight conglutinating effect usually exerted by the serums of newborn infants, the serum of premature infants may occasionally be capable of eliciting in vitro clumping of blood cells moderately sensitized by incomplete antibodies. Adult serums were treated with an excess of sensitized cells in an attempt to extract the conglutinin from the serums and then to use these adult serums as diluent to determine the conglutinin titer of infant serums. However complete inactivation of adult serum could not be obtained either with an excess of sensitized cells or old serums with very low conglutinating activity. Adult serums with very little conglutinating activity were used as diluent for determination of the conglutinating titer of 90 serums of infants. The cord serums showed little conglutinating activity, with average titers of 1: 4.6 in infants between the ages of 2 and 14 days as compared to an average titer of 1: 19 in adults. It is of practical importance that in the presence of Rh-positive erythrocytes containing a small charge of incomplete antibodies, the conglutinating activity of fetal or of newborn infant serums will not always be sufficient to elicit conglutination. Thus transfusions in hemolytic disease of the newborn may be harmful because of the transfusion of conglutinin together with the erythrocytes of the adult blood. Both protein content and conglutinating activity of adult blood are unphysiological for the newborn infant. The authors believe that erythrocytes suspended in plasma diluted with sodium chloride solution to the average physiological protein level of newborn infants is best for exchange *transfusions.*

BOOK REVIEWS

The Physiology and Pathology of Hemostasis. By Armand J. Quick, Ph.D., M.D., Professor of Biochemistry, Marquette University School of Medicine, Milwaukee. Cloth. $4. Pp. 188, with 18 illustrations. Lea & Febiger, 600 S. Washington Sq., Philadelphia 6, 1951.

This excellent manual serves to summarize much of the recent work in the rapidly expanding field of blood coagulation. Much of the work is a recapitulation of the author's recent publications in the field, a field in which he is an acknowledged authority. The style is good, and the format is excellent. The book suffers, unfortunately, from a lack of scientific detachment and objectivity in many of the presentations of controversial material, for example, the value of the two-stage prothrombin test, Ac globulin, and Owren's factor V. At times this is carried to a point where the text takes on the nature of a polemic, with but one side of the controversy being presented. The bibliography is excellent. The section on methods is extremely valuable, especially in the presentation of recently introduced techniques. It suffers from the exclusion of tests that the author does not consider worth including. There are only a few minor typographical errors, for example, in Tables X and XI. Within its limitations, the book serves a very useful purpose.

Pioneer Doctor. By Lewis J. Moorman, M.D. Cloth. $3.75. Pp. 252, with illustrations. University of Oklahoma Press, Norman, 1951.

This book tells of many incidents in the life of a physician who is genuinely interested in what he can do for the sick. Dr. Henry A. Christian points out, in the foreword, that it is such stories of medical practice that are needed today to counteract the fact that medicine has "become more mechanistic and less humanistic, more mechanical and less spiritual than in the past." Dr. Christian says there seems to be decreasing interest in man as a human being as he passes through a hospital regimen of technicians and tests, of apparatus and machines. Books like this one should be a balance against such tendencies. Dr. Moorman's professional life has been spent mostly in Oklahoma, where, at the beginning of the last century, he began the practice of medicine in frontier villages (Jet and Chickasha) among the rugged plainspeople whom he loved. The numerous humane stories from his practice are most interesting. After years of practice on the unplowed prairies, he went abroad for postgraduate study in the clinics of Vienna, then returned to Oklahoma City, where he became especially interested in the treatment and care of tuberculous patients. His knowledge gained in this special field is reviewed in several chapters in this book. Dr. Moorman was a teacher in the University of Oklahoma School of Medicine for many years and finally became dean of the school.

Medical Neuropathology. By I. Mark Scheinker, M.D., Assistant Professor of Neuropathology, University of Cincinnati College of Medicine, Cincinnati, Ohio. With foreword by Marion A. Blankenhorn, M.D., Professor of Medicine, University of Cincinnati College of Medicine. Cloth. $10. Pp. 372, with 186 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 49 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, 1951.

This is the third book on neuropathology which has been written by Dr. Scheinker in recent years. In this volume the author states that he has attempted to present neuropathology in its relation to internal medicine and general pathology. Much of the book is devoted to the relation of disturbances of the central nervous system to cardiovascular disease—184 of 345 pages. In this section the author emphasizes his impression of the importance of functional vascular disturbances: vasospasm, vasoparalysis, stasis, and thrombosis without disease of the vessel walls. Much of what the author has to say is controversial, but he does not supply sufficient factual data to permit the reader to evaluate his hypotheses. In fact, the entire book is characterized by its superficial treatment of the subject matter. In the remainder of the book the author discusses cerebral disorders due to exogenous toxins and blood dyscrasias and associated with diseases of the lung and liver, and neuritis.

The preparation of this book has not received the care of which the subject and the excellent job of printing are worthy. There are several misspelled words and names. Many of the articles cited in the text are not included in the bibliography. In a few instances the author's failure to mention modern developments is appalling. On page 346 where the etiology of kernicterus and icterus gravis neonatorum is discussed there is no mention of the Rh factor, and the most recent reference cited is dated 1935 but is not given in the bibliography. On page 287 where he discusses influenzal meningitis, the mortality is given as eighty-five to ninety-four per cent; no mention is made of the improvement obtained with modern chemotherapy and antibiotics. The most recent reference to the literature is dated 1922, and it is not to be found in the bibliography. There are a number of neurological disorders that are commonly associated with disturbances in other parts of the body which are not included in this book. Most noteworthy are meningococcic meningitis, the frequently associated meningococcemia and disturbance of the adrenals; the acute encephalitic disorders associated with vaccination and the acute infectious diseases (except pertussis), and parasitic infestations.

Biometric Analysis: An Introduction. By Alan E. Treloar, Ph.D., Professor, Division of Biostatistics, School of Public Health, University of Minnesota, Minneapolis. Paper. $4.50. Pp. 251, with illustrations. Burgess Publishing Company, 426 S. 6th St., Minneapolis 15, 1951.

The author of this book has undertaken the difficult task of setting forth, for graduate students in the biological and social sciences, the most essential principles of biometry. The primary objective has been to emphasize the reasoning behind the statistical methods. Readers who hope this book may provide a royal road to statistics will inevitably be disappointed. However, the book abounds in numerical examples from clinical and preventive medicine, and prospective authors of papers reporting therapeutic results would do well to read the section on the fourfold table on pages 231 to 237.

A number of subjects of great interest to medical readers are not represented in the index: the rank-difference method of estimating correlation, measurement of reliability and validity, Spearman's coefficient of correlation, self-correlation, test-retest methods, and the problem of scoring new tests. The author also confuses his reader by using the word "control" in different senses on pages 6 and 215. It is to be hoped that this semantically objectionable word will soon be replaced by something better. Aside from these criticisms the book is evidently written with great care; the author's style is commendably direct, and the general appearance of the book is attractive.

Die Chirurgie der Poliomyelitis. Von Dr.med. Helge Sjövall. Chirurgie in Einzeldarstellungen, Band 46. Cloth. 13.80 marks. Pp. 98, with 52 illustrations. Walter de Gruyter & Co., Genthiner Strasse 13, Berlin W 35, 1951.

This small monograph has two main divisions, the first dealing with over-all considerations and the second with special surgical phases. Although somewhat abbreviated, etiology, pathogenesis, serology and immunology have been presented well. Schematic presentations are concise and clear, and roentgenograms interspersed throughout the text amplify many of the postoperative results. An extensive alphabetically arranged bibliography is included. The book mainly is a résumé of many of the accepted methods previously described. It can be recommended as a reference work for anyone able to read German.

The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

QUERIES AND MINOR NOTES

MASS BLOOD-GROUPING PROGRAM

To the Editor:—*A blood-typing program is being undertaken here under the sponsorship of the American Legion. Since the present cost of typing serum runs about 40 cents a person, we are seeking a cheaper source of serum. We are considering preparing serum from persons giving a marked reaction to regular commercial typing serum, this serum in turn to be used as typing serum. Please advise as to the feasibility of such a procedure. This typing program is to tie in with the civil defense program here.* *L. K. Williams, M.D., Mena, Ark.*

Answer.—A mass blood-grouping program would be difficult to justify if blood-grouping errors occurred with any frequency. Frequent errors have occurred when poor quality testing serums were employed; undoubtedly, it was the frequency of such errors that led to the establishment of minimum requirements for blood-grouping serums through the agency of the National Institutes of Health. Few institutions or organizations have the personnel and facilities for preparing serums whose quality will equal or exceed these minimum requirements. For most institutions, the simplest assurance of quality is the procurement of anti-A and anti-B blood-grouping serums from a laboratory licensed by the National Institutes of Health for preparation of this material. In contrast to the frequent errors that may be anticipated with poor quality testing serums, the use of high quality government-licensed and tested serums is a powerful assurance against error, particularly under the probably hurried conditions of a mass blood-grouping program. The physician should insist on the use of high quality serums as a sine qua non for the contemplated program and should not allow himself to be misled by considerations of pseudoeconomy.

A tentative plan, for mass blood typing and a report on the typing program of Jackson, Michigan appears in the *American Journal of Clinical Pathology*, V. 21 #4 pp. 375 and 387, April, 1951.

MONGOLISM

To the Editor:—*A girl, 5, was referred to me for neurological evaluation. She had almost all the stigmas of mongolism, as described by C. E. Benda; she also had strabismus, nystagmus, and congenital bilateral deafness. Her twin brother is normal physically and precocious mentally. Is it not unusual for mongolism to be associated with congenital deafness and a normal twin sibling?*

Frederick P. Pokrass, M.D., Reading, Pa.

Answer.—Mongolism is almost always present in one twin only if the twins are dizygotic (dissimilar). There are only about six cases known where dizygotic twins were both affected with mongolism. Homozygotic twins are said to be always affected with mongolism concordantly. In the case under discussion, the normal twin brother may therefore be expected to be a perfectly normal child. Congenital deafness is rare in mongolism. Since many persons with mongolism who would have died in previous years are now surviving, we may see various congenital anomalies more frequently than have been observed previously.

CHOREA MINOR

To the Editor:—*I will appreciate authoritative advice as to the role of antibiotics and cortisone in chorea minor.*

Walter Newman, M.D., Springfield, Mass.

Answer.—There is no evidence that antibiotics or sulfonamides influence the course of chorea minor. From the evidence available at this time, the same may be said of cortisone and pituitary adrenocorticotropic hormone (ACTH).

ERYTHROBLASTOTIC BABY

To the Editor:—*A 22 year old multipara is pregnant. She is Rh negative, and her husband is Rh positive. Roentgenographic examination has shown a twin pregnancy. Her first and third babies, aged 4 and 2 years, are living and well. The second baby died six days after birth. The third child was jaundiced and pale at birth. The patient has had several abortions and has an Rh antibody titer, negative saline agglutinins and positive conglutinins through 1:320 dilution. Is there enough evidence at this time to decide that these fetuses are erythroblastotic and that they will require exchange transfusions immediately after birth even though they may not be jaundiced, edematous or anemic at that time? What is a significant level of saline and conglutinin Rh antibody titer? Can you describe the technique of exchange transfusions through the umbilical vein, with the use of silicon-coated tubing or catheters? I would appreciate other suggestions in regard to the management of this case?*

R. O. Chambers, M.D., Glendive, Mont.

Answer.—The clinical history and serologic findings indicate that one is dealing with a pregnant Rh-negative woman who is sensitized to the Rh factor and is therefore apt to have an erythroblastotic baby. The prognosis depends primarily on the Rh type of the fetus. Therefore, the husband should have more complete Rh-Hr tests, and the blood of the two living children should be typed as well as the blood of the husband's parents, if available, to determine, if possible, whether the husband is homozygous or heterozygous. If the husband is homozygous, the expected baby will be Rh positive and therefore almost surely erythroblastotic; if the husband is heterozygous, there is a 50 per cent chance that the baby will be Rh negative, in which case the maternal Rh antibodies cannot harm it. One must bear in mind that, while identical twins always have the same blood type, in the case of fraternal twins one may be Rh positive and the other Rh negative.

The severity of the illness in the fetus or baby depends primarily on the height and duration of presence of the maternal antibody titer, though there are other factors that also appear to play a role. The Rh antibodies are of two main varieties: agglutinating antibodies, which clump Rh-positive cells in saline as well as in other mediums, and conglutinating antibodies (univalent, blocking or "incomplete" antibodies), which do not clump positive cells in saline mediums but do clump cells in plasma, albumin and similar mediums. It is only the latter type of antibodies that traverses the placental barrier and is clinically significant. Since a number of tests of different sensitivities have been devised to detect univalent Rh antibodies, the report of antibody titer should specify the method used. For example, a serum with a titer of only 1 unit by the blocking method would have a titer of about 20 to 40 units by the conglutination method, 40 to 80 units by the antiglobulin method and 100 to 200 units in tests with enzyme-treated cells. If the antibodies are so weak that they can be demonstrated only in tests with enzyme-treated cells or by the antiglobulin method, the manifestations in the Rh-positive baby are apt to be mild or subclinical. On the other hand, if the antibodies are so strong that the blocking test is distinctly positive, then there may be about a 50 per cent chance that the Rh-positive fetus will be stillborn. The outcome in cases with titers of intermediate values is roughly correlated with the height of the antibody titer, but it is not absolutely predictable because other factors play an important role, especially the manner in which the case is managed. When the baby is born, its blood should be typed. If the baby is Rh positive, and the mother had a significant level of univalent Rh antibodies antenatally, the baby will almost surely be erythroblastotic, and it is justifiable to proceed with an exchange transfusion on these findings alone. Many workers prefer to perform tests to determine whether the baby is clinically ill with

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The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

erythroblastosis before proceeding with the exchange transfusion. For this purpose the hemoglobin concentration, icterus index of the cord serum and tests for coating of the baby's red cells by Rh antibodies (antiglobulin, or Coombs test, and conglutination test) are most helpful.

For the technique of performing exchange transfusion, one may refer to the papers by Wallerstein (The Treatment of Erythroblastosis Fetalis by Substitution Transfusion, *Blood,* Spec. Issue no. 2, p. 170, [Jan.] 1948), Wiener and Wexler (Erythroblastosis Fetalis: Method of Wiener and Wexler in Conn, H. F.: Current Therapy, Philadelphia, W. B. Saunders Company, 1950, pp. 160-162, and Brancato (Exchange Transfusion in Erythroblastosis Fetalis and Other Conditions, *Am. J. Dis. Child.* **80:**1 [July] 1950).

BRONCHIECTASIS

To the Editor:—*A 28 year old man has had bronchiectasis for 20 years. Operation was refused. An x-ray of the left dome of the diaphragm is irregular and shows limited motion. The hilar shadows are thickened and show dilated bronchioles. Staphylococcus albus and Escherichia coli are present in the sputum. Spasmodics have been given and creosote oil by postural inhalation. Aureomycin was given for two weeks. After a rest period, chloramphenicol was given. After another rest period, sulfamerazine was given for three days. There is some improvement. After each postural treatment the patient eliminates ½ glass of pus. The ausculatory sounds are improving in the apexes of both lungs. What antibiotics are advisable?*

Jacob Aisenstat, M.D., New York.

Answer.—It seems unfortunate that operation was refused by this patient. It appears that he is suffering from bronchiectasis of the left lower lobe. At best, the therapeutic use of sulfonamides or antibiotics in this patient can be considered only as a palliative measure, from which lasting improvement cannot be expected. While it might be possible, through the continued use of aureomycin, chloramphenicol or terramycin, to so suppress the infection that for a time considerable improvement in the patient's general condition would occur, such a procedure would have its dangers. There is an increasing number of reports, such as that of Woods and co-workers (*J. A. M. A.* **145:** 207 [Jan. 27] 1951), which definitely indicate that care must be taken when the newer antibiotics are being employed so that a superinfection with yeastlike organisms that are resistant to chemotherapy and antibiotic therapy does not occur. Pulmonary moniliasis has developed in patients receiving one or the other of the newer antibiotics for the treatment of bronchiectasis. Because of these observations, it would seem best that the patient described should be treated with sulfadiazine or an antibiotic such as aureomycin, terramycin or chloramphenicol, only for the control of an acute exacerbation or spread of bronchiectatic lesions. In adults, treatment with 2 to 3 Gm. per day of the chosen antibiotic, for seven to 10 days, will assist in controlling the exacerbation or spread of the infection. Conservative measures, such as bed rest and postural drainage, should be used while the antibiotic or sulfonamide is being given.

MEASLES WITHOUT A RASH

To the Editor:—*I have seen a number of cases in recent epidemics which have a typical clinical picture of measles except for the rash. Am I justified in stating that such persons have had measles?*

M.D., New Jersey.

Answer.—Sometimes physicians assert that they have seen measles patients without a rash. Usually such observations are difficult to substantiate and yet they actually seem to occur in rare instances. When immune globulin is used for prevention there should be no rash. When measles is modified by immune globulin, an eruption is to be expected, but its intensity and duration may be greatly diminished. The only justification for asserting that a patient had measles without a rash would be the failure of such a patient to contract the disease when exposed to an early case of measles. Twenty-five years ago Tunnicliff and Taylor (*J. A. M. A.* **87:**846 [Sept. 11] 1926) reported a skin test for susceptibility to measles; however, the method is no longer in use.

FLUSHING OF FACE AND EARS

To the Editor:—*I have been treating a dentist, 48, who for the past 10 years has had attacks of severe flushing of face and ears, more prevalent in the winter and on changes of temperature. He feels as if he were "grippy," with lethargy and weakness of thighs but no fever or pulse changes. The attacks last for one-half hour to several hours and disappear spontaneously, with face and ears resuming their natural color. These attacks closely resemble climacteric symptoms of women. Except for a labile type of blood pressure, the physical and laboratory findings are within normal limits. I have diagnosed the condition as vasomotor instability. I would appreciate your opinion.*

M.D., New York.

Answer.—Attacks of flushing of the face and ears belong to a group of vasodilator phenomena that may be of central or peripheral origin. The so-called diencephalic syndrome is accompanied by flushing of the face and neck, together with a rise in blood pressure. It may be precipitated by a small dose of subcutaneously administered histamine. On the other hand, it may represent a biphasic reaction of an initial vasoconstriction, with pallor and profuse sweating and should be tested with piperoxan hydrochloride (benzodioxan), so that pheochromocytoma may be ruled out. A small irritative lesion near the vasodilator center may have to be considered. Nothing is said about salivation and lacrimation during attacks. Local vasodilater phenomena may occur as a result of previous exposure to cold or sunlight, which results in a hypersensitive state. In addition to physical allergies to cold and light, one must consider drug sensitivity to procaine in a dentist, which, of course, would most probably affect his hands but may as a result of some localizing factor result in vasodilation and increased permeability on the face. If the pressure falls during such attacks then an allergic mechanism is more likely. The feeling of lethargy and weakness of the thighs may indicate cerebral vasodilation or edema. Nothing has been said about headache during the attack, the presence of which would then classify this as a case of erythralgia of the head, which often responds to desensitizing doses of histamine.

Such a patient requires intensive study in a hospital under personal observation of a physician specializing in neurovascular phenomena. It may be a harmless but intractable symptom; it may be a tumor of the third ventricle. Polycythemia must be ruled out even if the hemoglobin and the blood cell count are within normal limits.

ANOSMIA

To the Editor:—*What can be done for a 50 year old woman who has almost complete loss of taste and partial loss of smell? She can distinguish only sweet, sour, bitter and salt. This condition followed an acute upper respiratory infection one year ago, when she received four injections of penicillin.*

Earl M. Slagh, M.D., Elsie, Mich.

Answer.—Anosmia, or loss of the sense of smell, is a symptom rather than a disease. In general, for the normal perception of odors three factors are essential: 1. It must be possible for the odoriferous particles to come in contact with the olfactory region of the nose. 2. The mucous membrane must be moist and in a healthy condition. 3. The olfactory terminals and their nerve tracts must be normal. It will be seen that interference with the sense of olfaction may therefore be (*a*) of an intranasal or (*b*) of an intracranial character. The loss of taste complained of by the patient is due to the abeyance of the perception of flavor, which depends on the sense of smell.

If the anosmia is due to an obstruction, a foreign body or any one of many intranasal conditions that prevent air from reaching the olfactory region, surgery, to relieve obstruction and to permit the air to reach the olfactory region, may effect a cure. If, on the other hand, the nerve endings in the olfactory mucous membranes have been damaged from atrophic rhinitis or any irritant, the likelihood of relief is minimal. If the cause of the anosmia is intracranial, the prognosis is hopeless. Hysterical anosmia does occur from time to time; this form is treated chiefly by suggestion.

CARBON DIOXIDE TREATMENT OF PSYCHONEUROTICS

To the Editor:—*An article in* Time *several months back reports that Dr. Meduna has had some success in treating pyschoneuroses through giving inhalations of carbon dioxide. Being a stutterer, I am interested in the matter.*

Robert E. Longacre, M.D., Mexico, D. F.

Answer.—The carbon dioxide therapy consists of repeated inhalations of a gas mixture containing 30 per cent carbon dioxide and 70 per cent oxygen. The average number of respirations administered at each treatment is about 35. The number of treatments varies greatly from case to case, the range being between 30 and 120 treatments. The treatments are usually given three times a week on alternate days. All psychoneurotic and psychosomatic disorders may improve with the treatment, with the exception of obsessive compulsive neuroses and psychotic conditions. Dr. L. J. Meduna, of the University of Illinois has written a monograph dealing with the carbon dioxide treatment (Carbon Dioxide Therapy—A Neurophysiological Treatment of Nervous Diseases, Springfield, Ill., Charles C Thomas, Publisher). He reported on 33 stutterers who finished the course of treatment. Eleven of these achieved 100 per cent improvement; three patients achieved better than 75 per cent improvement; two patients achieved 50 per cent improvement and five patients achieved 25 per cent improvement. That would mean 11 cures and 10 improvements out of the group of 33.

Dr. Kindwall, Milwaukee, reported about 50 per cent improvement in a group of 70 psychoneurotic patients with diverse conditions. Reports on the carbon dioxide treatment were favorably received by the First International Congress of Psychiatry, held in Paris in October 1950.

FIVE PER CENT HUMIDITY

To the Editor:—*I am the plant doctor for a corporation which will soon put quite a few men to work where the humidity will be limited to 5%. Have you information on how to adjust the salt and water intake for these men while working?*

Howard P. Sloan, M.D., Bloomington, Ill.

Answer.—Among healthy workers, thirst alone is a sufficient guide to water intake, provided adequate salt entry is accomplished. On a practical basis one standard salt tablet (slowly disintegrating type preferred) with every substantial drink of water is enough. In a few portions of the country, at least seasonally, the outside air provides only 5% relative humidity. This state is to the delight of most exposed persons otherwise comfortably situated. In extreme cold weather in houses heated by hot air, a 5% humidity is not extraordinary. In both circumstances complaints that arise concern skin and mucous membrane dryness and cracking, and difficulty in keeping warm even when dry bulb thermometers register high. High altitude adds to discomfort due to cold when one is not in sunshine. This query fails to note the prospective temperature, the degree of air motion, and the extent of physical labor, all of which are important considerations. The foremost trouble, notably in hot summer weather, may appear on passing from the artificial workroom climate to the natural outside state. Metabolic adjustments quickly imposed may induce "weather shock." The maintenance of 5% humidity in the presence of varying temperatures is desirable in keeping with outside weather.

FRIGIDITY

To the Editor:—*What therapy should I use for a patient who is under nervous tension during intercourse with her husband? She cannot relax and reach orgasm. Would male hormone help?*

M.D., New York.

Answer.—The male hormone is of considerable help to some frigid women, but it does not always relax nervous tension. One may try giving 20 mg. of testosterone propionate hypodermically three times a week for four weeks, or a 5 mg. buccal tablet of testosterone twice a day for 20 days. If the male hormone therapy does not help, the patient should have psychotherapy, preferably by a trained psychiatrist.

CHLORINATED WATER

To the Editor:—*What studies have been made to determine the deleterious effects of heavily chlorinated water that is used for drinking purposes? The water supply in our town is chlorinated but not filtered. At times it is possible to smell the chlorine. Could this harm the gastrointestinal or the genitourinary tract? William J. Llewellyn, M.D., Nicholson, Pa.*

Answer.—A search of the literature did not reveal any organized investigations on the problem of the effect of heavily chlorinated water on the human body. Allergic manifestations of chlorinated water have been reported. Many cases of asthma have been traced to an allergy to chlorinated water (Watson and Kibler: *J. Allergy* 5:197, 1933; Bohen: *J. Allergy* 5:199, 1933; and Sheldon and Lovell: *Am. Pract.* 4:43 [Sept.] 1949). In all these cases the asthma was relieved or disappeared when the patient drank distilled or unchlorinated water.

Sensitivity to greater concentrations of chlorine and chlorine compounds than are usually found in drinking water has been reported. Cases of sensitivity to sodium chloride (Guttman: *J. Allergy* **15**:395, 1944) have been reported. Cases of allergic dermatitis caused by dilute solutions of sodium hypochlorite have been reported (Urbach and Gottlieb: Allergy, ed. 2, New York, Grune and Stratton, 1946, p. 404).

ACTH, CORTISONE AND HEMORRHAGIC TENDENCIES

To the Editor:—*Please let me know whether there are any reports available on hemorrhagic tendencies from the use of cortisone.*

M.D., New York.

Answer.—Thus far there has been considerable speculation and some suggestive experiments, but little specific evidence to show that increased hemorrhagic tendencies develop with the use of pituitary adrenocorticotropic hormone (ACTH) and cortisone. There is some evidence that they may actually produce hypercoagulability of the blood and a beneficial effect on purpuras of allergic origin has been observed. Adrenal cortex hormones generally exercise a capillary stabilizing effect in the presence of a variety of stress stimuli. Proper precautions in their use should be observed, since there have been reports of gastrointestinal bleeding during the administration of cortisone and ACTH, presumably due to active bleeding ulcers that have developed or reactivated ulcers. Their use is therefore contraindicated in patients with a history of an active or previously active bleeding peptic ulcer. Also, patients with Cushing's syndrome, a type of hyperadrenocorticism, often exhibit easy bruisability. A similar state of adrenal overactivity may occur with prolonged use or high dosages of ACTH or cortisone.

EXTERNAL OTITIS

To the Editor:—*My 14 year old daughter has had bilateral external otitis. Cultures show a pure growth of Bacillus pyocyaneus. I tried local instillations of terramycin and am now trying streptomycin, to which the organism is sensitive in vitro. The results are somewhat encouraging, in that the edema and pain are subsiding, but the cultures are still positive. Any recommendations as to treatment will be appreciated.*

M.D., New York.

Answer.—Bacillus pyocyaneus is one of the most frequent causes for chronic external otitis infections. Most cases respond to cleanliness and to the local use of tincture of thimerosal 1 to 1,000 or 2 per cent aqueous methylrosaniline chloride (gentian violet). Recently aureomycin powder has been used with excellent results. One should carefully clean the ear and then blow in the powder gently, leaving only a small amount in the ear. A larger amount tends to cake and is difficult to remove. Aureomycin otic solution may be used instead of the powder. Local sensitization to any medication is apt to occur, so that it may be necessary to change to another type of medication if the infection does not clear up promptly. Where the infection is stubborn and tends to recur, an attic cholesteatoma should be looked for.

FIBROSITIS AND WEATHER VARIATIONS

To the Editor:—*Four years ago, I began to have seasonal hay fever (from the middle of May to the first of September), which has not responded to treatment by allergists. Three years ago, chronic lumbago, right sacroiliac neuritis, and fibrositis of the cervical vertebrae developed; they give me trouble in the winter but go away during hot weather. X-rays and examinations by orthopedic specialists are negative. All tests and examinations, otherwise, are negative. I am 41 years old and feel pretty good except for chronic fatigue. Is there any connection between the hay fever and fibrositis? Why does fibrositis improve in warm weather? I have not tried cortisone or ACTH. What treatment would you advise?*

M.D., Georgia.

Answer.—Studies of fibrositis have thus far failed to disclose any relationship to clinical forms of allergy, such as hay fever, asthma, urticaria, and angioneurotic edema. Desensitization procedures and limitation of dietary intake of foods that give positive results in skin tests have failed to relieve fibrositis. Antiallergic pharmaceutical preparations do not provide relief of fibrositis in usual cases. Histamine desensitization, epinephrine, ephedrine, and antihistaminic drugs have been tested and discarded.

Discovery of the therapeutic effects of cortisone and pituitary adrenocorticotropic hormone in rheumatoid arthritis has led to study of patients with rheumatic diseases, with a view to determining whether adrenocorticotropic insufficiency is present in those conditions. Available information at present indicates that no such insufficiency is present in rheumatoid arthritis, osteoarthritis, or fibrositis.

Relationships between symptoms of fibrositis and weather variations have been studied. There seems little doubt that a relationship exists, in that many patients with fibrositis note symptomatic aggravation in times of rapidly changing weather. Factors examined included temperature, humidity, barometric pressure, and atmospheric electricity. Only barometric pressure variations have shown any close association with changing symptoms. Other factors do not seem to play a part. It is worth noting that alterations in relation to weather are purely subjective; there does not appear to be an acceleration or diminution of organic tissue lesions in association with weather changes.

Studies of therapeutic application of cortisone and pituitary adrenocorticotropic hormone have not progressed to a point where it is possible to recommend their use in fibrositis. One should consider that this condition is fundamentally benign and devoid of crippling effects and that present day use of these hormones is expensive and to some extent dangerous. Further study of this point is desirable, but at present, it seems advisable to employ more conservative therapeutic measures. Treatment measures currently in use for fibrositis include regulated periods of rest and intensive local physical therapy in the form of baking, hot applications, massages, and exercises. Infected foci should be removed on general principles. Use of analgesic drugs, such as acetylsalicylic acid, is helpful for relief of pain, and sedatives, such as phenobarbital, often help such patients to obtain restful sleep.

WINE HABITUÉS

To the Editor:—*What is the difference between so-called winos and other types of chronic alcoholism? In my experience, the "winos" have been much more difficult to treat.*

Car. B. Cone, M.D., Vancouver, Wash.

Answer.—"Winos" are usually considered to be "skid row" type persons who drink cheap wine usually containing, according to some scientists, a quantity of fusel oil. For the most part these persons are both mentally and physically deteriorated when they reach the "row" stage. They continue on in "skid row," are taken to jail or a chronic psychiatric hospital, or end in the morgue. Owing to the physical and psychiatric changes, most approaches have not been helpful (medical, medical-psychological, lay group and spiritual or moral). The "winos" are more difficult to treat because of their low level philosophy and sick mentation acquired rather early and found many times even in the temporary "skid row" younger inhabitant. The treatment is further complicated by the fact that nearly all "winos" drink, sip or "slug" wine into their bodies continuously, without taking in food of any kind, thereby again complicating the treatment by the presence of food deficiency effects on their physical and neurological systems.

WHISKY FOR PERSONS WITH "STROKES"

To the Editor:—*What effect has alcohol (whisky) on cerebral blood flow? Should it be recommended for persons with strokes?*

G. L. Lester, M.D., Chautauqua, N. Y.

Answer.—C. B. Thomas (*Arch. Neurol & Psychiat.* 38:321, 1937) states that alcohol causes a dilatation of the cerebral blood vessels. Stanley Cobb (*A. Res. Nerv. & Ment. Dis. Proc.*18:719, 1938) believes that alcohol causes dilatation of the cerebral vessels and that many patients with cerebral vascular disease show improvement with the daily ingestion of small quantities of alcoholic beverages. Even if it does not improve the cerebral circulation or the neurological state of these persons, it may render their lives more tolerable and therefore be distinctly worthwhile.

INFANTILE DIARRHEA

To the Editor:—*In a reply to a query in* The Journal *on the oral therapy of diarrhea* (**146**:*416 [May 26] 1951) your authority states that administration of 5% dextrose solution given orally would not be wise because of the resulting increased fermentation. This drawback is not regarded as valid for rice water, which is thought to pass so quickly along the gastrointestinal tract that fermentation is not increased.*

The theory that there are unfavorable results from the administration of carbohydrates in diarrhea was originally proposed by Finkelstein and was the basis for his well-known protein milk. However, in subsequent years, even Finkelstein himself was convinced that this concept was erroneous, and in later writings he freely advocated the addition of sugar to protein milk in cases of diarrhea. The general experience in this country in the past quarter of a century has supported Finkelstein's later views that the administration of carbohydrate is helpful rather than harmful in these cases. Although some degree of fermentation of unabsorbed carbohydrate may occur in digestive disorders, it would appear that the fermentation only affects that fraction of the carbohydrate, which cannot under these circumstances be assimilated. The products of fermentation, once thought to be irritating and to aggravate the diarrhea, appear to be harmless in that respect.

L. Emmett Holt Jr., M.D.,
New York University College of Medicine,
477 First Avenue, New York 16.

BISHYDROXYCOUMARIN AND MYOCARDIAL INFARCTION

To the Editor:—*In* The Journal, *May 12, in Queries and Minor Notes I read with great interest your answer to the question on anticoagulant therapy "Should every patient with myocardial infarction receive dicumarol® for the rest of his life?" I concur with your answer, and should like to add our own experience with anticoagulant therapy.*

We have studied a series of 150 patients with myocardial infarction. Half of them receive bishydroxycoumarin (dicumarol®) in addition to the usual therapy. No appreciable difference in mortality was noted between those patients who received the drug and those who did not. Bishydroxycoumarin increases materially the per capita cost and in some instances added many anxious days. We believe that the rather impressive favorable statistics reported by some clinicians may have been due to effective suggestive therapy, which accompanied the medical attention given to all patients receiving anticoagulant therapy. Bishydroxycoumarin or other anticoagulants are of distinct value and indicated only in cases of myocardial infarction complicated by thromboembolic phenomena.

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AURICULAR FIBRILLATION

Myron Prinzmetal, M.D., Robert Oblath, M.D., Eliot Corday, M.D., I. C. Brill, M.D., H. E. Kruger
L. Allen Smith, M.D., Joshua Fields, M.D., Rexford Kennamer, M.D.
and
John A. Osborne, M.D., Los Angeles

In past decades, many of the ablest medical investigators have attempted to resolve the mechanism of auricular fibrillation, the most important disturbance of the human heartbeat. The inconclusive nature of the results obtained by these workers undoubtedly is attributable to the fact that they did not utilize direct methods and their tools were not sufficiently sensitive to analyze the complex activity in the fibrillating auricles. For example, it it understandable that Sir James MacKenzie could not resolve the complex mechanism of auricular fibrillation from observations based solely on crude pulse tracings. The various earlier hypotheses were largely abandoned in 1920 when Sir Thomas Lewis, after extensive experimentation, advanced the circus movement theory. In the present investigation, the fibrillating auricle in man and animals has been reexamined with techniques not previously employed and apparatus not hitherto available. By these new methods the circus movement theory of auricular fibrillation has been found invalid, and the nature of the events in the fibrillating auricles elucidated.

Among the earliest hypotheses was that suggested in 1874 by Aubert and Dehn[1] and later supported by Kronecker and Schmey[2]; these workers believed that fibrillation was produced by injury to a nervous "coordination center" in the heart. In 1887, McWilliam[3] observed that spontaneous recovery from the arrhythmia often occurs in the dog. McWilliam offered the alternative concept that the fibrillatory wave pursues a sinuous path through the auricles, reentering its original pathway on completion of its course. In 1895, Englemann[4] advanced the theory of polytopic impulse formation, which gained the support of leading contemporary workers, including Lewis[5] and Winterberg,[6] until it was abandoned in favor of the circus movement theory. Mackenzie[7] in 1913 suggested that the auriculoventricular node was the cardiac pacemaker in the fibrillating auricle; he termed the arrhythmia "auriculoventricular nodal rhythm." The concept of tachysystole or a rapid tachycardia originating from a single ectopic focus was derived by Rothberger and Winterberg[8] in 1914 from the first investigation of auricular flutter and fibrillation by means of direct auricular leads.

Although the reentry concept of McWilliam, the intramuscular block experiments of Porter,[9] and the writings of Garrey[10] provided a basis for the circus movement theory, the widespread acceptance accorded this concept may be attributed to the investigations of Lewis and co-workers.[11] From a three year experimental study consisting primarily of an analysis of curves derived from direct auricular leads, Lewis concluded that auricular fibrillation is due to a single excitation wave traveling in a generally circular but variable and sinuous pathway through the auricles around the venae cavae. Reentry of the main wave into the circus pathway and the occurrence of centrifugal daughter waves arising from the main wave were postulated. The action of antifibrillary drugs was attributed to the supposed ability of these agents to eliminate the "excitable gap" on the circus pathway and thus to terminate the arrhythmia.

As Lewis himself recognized, the evidence provided by his study did not conclusively prove the circus movement theory. Because of the inadequate exposure of the heart used in his experiments, no observations could be made on the course of the excitation wave through the body of the left auricle. Because of the complexity and rapidity of the arrhythmia coupled with the relative insensitivity of the electrocardiographic equipment available, Lewis found that "anything like a complete analysis of the paths taken by the (fibrillation) waves becomes impossible."[11] Finally, most of the evidence supporting the circus move-

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9. Porter, W. T.: On the Results of Ligation of the Coronary Arteries, J. Physiol. **15**: 121, 1893.
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ment theory was derived from observations on experimentally produced auricular flutter; the occurrence of a circus movement in either experimental or clinical auricular fibrillation was largely assumed by analogy. Despite the absence of conclusive evidence, Lewis's circus movement concept is considered as established fact in the majority of standard textbooks discussing the mechanism of auricular fibrillation and at present is generally accepted by pharmacologists as the explanation for the antifibrillary action of various drugs.[12]

During the 30 years since Lewis' studies, a number of observers have reported findings which appear incompatible with the original circus movement theory, but none has succeeded in disproving the theory and none has provided direct and convincing evidence in support of an alternative hypothesis.[13] The inability of these workers to obtain conclusive proof concerning the mechanism of auricular fibrillation can be attributed to the limitations of the equipment and experimental methods at their command. Despite the technical advances of the late nineteenth and twentieth centuries, neither Lewis nor any previous or subsequent worker has been able to determine by direct observation precisely what occurs in the auricle during normal sinus rhythm or any auricular arrhythmia. In view of this circumstance, coupled with the fact that observations of the human auricles are few and relatively crude, an extensive study of the auricular arrhythmias was undertaken in our laboratory. During a four year period, modern apparatus was employed to investigate normal sinus rhythm and the four auricular arrhythmias in man and experimental animal.[14] The following report is a summary of the methods used and results obtained in the investigation of auricular fibrillation.

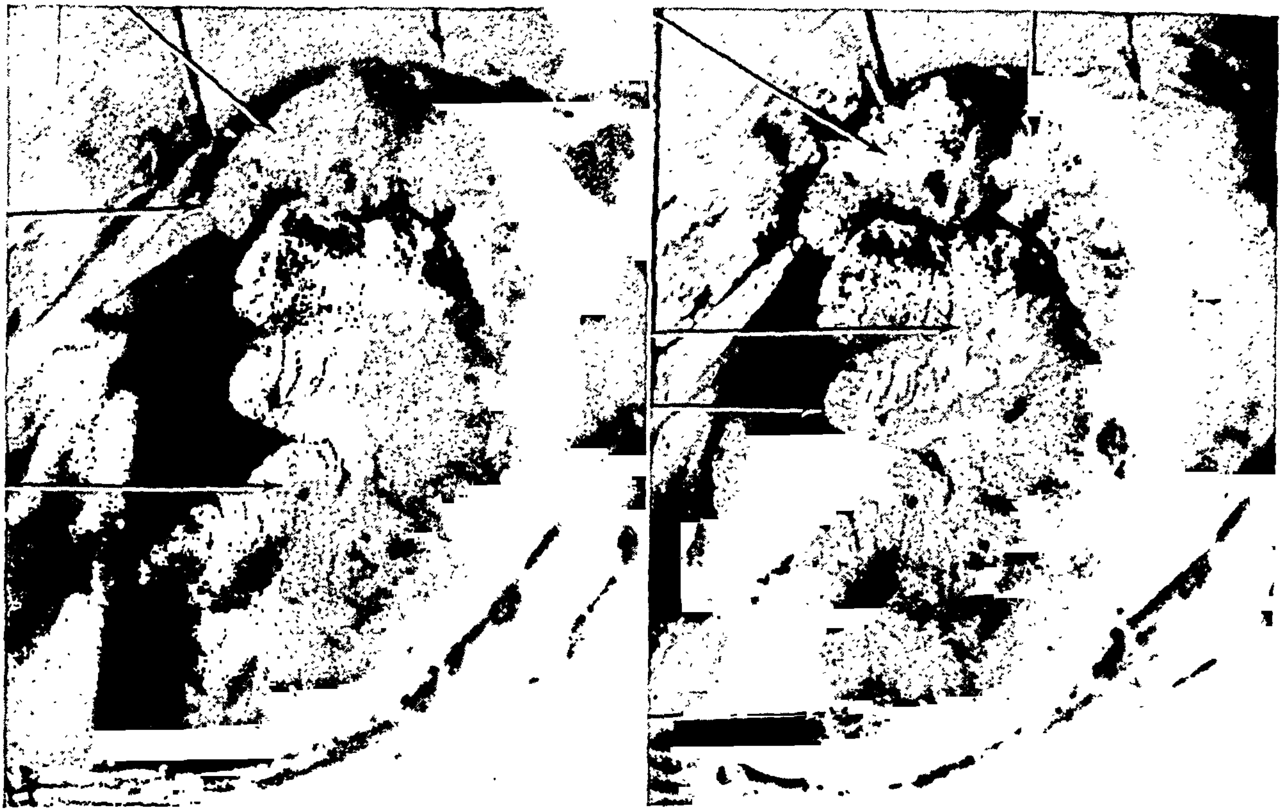

Fig. 1.—Left auricular appendix in a patient with mitral stenosis, auricular fibrillation, and congestive failure photographed just before the appendix was amputated for multiple emboli. There is a constant changing of the silhouette and surface configuration, which can be seen only in the motion pictures. Arrows point to small contractions. No circus movement is apparent.

EQUIPMENT AND METHODS

Many of the early investigations of auricular fibrillation were carried out before the electrocardiograph was available, while more recent studies have been based entirely on electrocardiographic interpretation. In the present investigation, the vast majority of observations in both man and animal were made by means of two recently developed instruments—the high speed cinematograph and the cathode ray oscillograph.

High speed color cinematographs of the fibrillating auricle in two patients were recorded during exposure of the heart for surgical removal of the auricular appendix. Experimentally produced auricular fibrillation in over 50 dogs was visualized in cinematographs of each auricle, of both auricles simultaneously, and of an area of the auricle approximately 1 cm. square photographed under high magnification. Identical equipment and photographic techniques were used in man and animal except for minor modifications designed to protect the patient. In pictures taken at 3,000 frames per second, the motion of the heart was slowed approximately 200 times when projected at 16 frames per second. The passage of a contraction wave could be clearly seen and studied. Even the minutest details of the rapid muscular movements in the fibrillating auricle were clearly demonstrated in the cinematographs for the first time. In our opinion, this visual evidence of the mechanism of auricular fibrillation is the most direct and most convincing reported to date.

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[12] Goodman, L., and Gilman, A.: The Pharmacological Basis of Therapeutics: A Textbook of Pharmacology, Toxicology, and Therapeutics for Physicians and Medical Students, New York, The Macmillan Company, 1941.

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The DuMont 279 dual beam cathode ray oscillograph was utilized to record multiple esophageal and limb leads in 24 patients with spontaneous auricular fibrillation. Single and simultaneous unipolar direct auricular lead oscillograms of the arrhythmia were obtained in 35 experimental animals. The oscillograph, an electronic device used with a preamplifier and camera, was resorted to after preliminary studies with various types of electrocardiographic equipment failed to yield a valid basis for conclusions concerning the mechanism of auricular fibrillation in either man or dog. Because of insufficient amplification and frequency response, mechanical inertia, and relatively slow maximum paper speeds, even the most advanced electrocardiographic machinery now available is incapable of accurately recording the rapid electrical activity in the fibrillating auricle. Among the advantages presented by the oscillograph are virtually unlimited amplification and frequency response, freedom from inertia, a recording speed 30 times greater, and a useful magnification several thousand times greater than that provided by standard electrocardiographic equipment.

The dogs used in the experiments generally were large, weighing 20 to 25 Kg. Morphine followed by intravenous administration of urethane in 25% solution proved most efficacious as an anesthetic. Artificial respiration was carried on through an intratracheal cannula. Early in the study, a relatively nontraumatizing operative technique was devised that permits complete exposure of both the right and left auricles. Thus the activity in all portions of the fibrillating auricles, including the hitherto unexplored body of the left auricle, could be observed in the cinematographs and direct lead oscillograms. The chief methods employed to produce auricular fibrillation were electrical stimulation and local application of aconitine.

MOTION OF THE FIBRILLATING AURICLE

In all essential respects, the cinematographic appearance of the fibrillating auricle is similar in man and in the experimental animal.

Cinematographic Appearance of Clinical Auricular Fibrillation.—When the auricles were observed in cinematographs of normal sinus rhythm, experimentally produced auricular premature systoles, paroxysmal tachycardia, and flutter, an orderly sequence of events was apparent: In each instance, alternating contraction and relaxation waves were seen to arise at a specific site on the auricle (the waves of normal sinus rhythm at the sinoauricular node, the waves of each arrhythmia at a single ectopic focus) from which they spread outward through the contractile auricular musculature in all available directions simultaneously. No such coordinated muscular activity occurs in clinical auricular fibrillation. Instead, cinematographs of the spontaneously fibrillating auricle in human subjects reveal the constant presence of a multitude of minute contractions and dilatations occurring asynchronously throughout all portions of the auricles except the noncontractile body of the left auricle and differing from any cardiac state previously described. Because of the rapidity and heterorhythmicity of the contractions, the silhouette and surface configuration of the auricles are constantly changing. Observers have compared the cinematographic appearance of the fibrillating auricle to a pot of boiling water or myriads of shimmering, reflected lights. Unfortunately, this effect of constant motion is largely lost in the still photograph shown in figure 1. No evidence of a circus movement, centrifugal daughter waves, or an "excitable gap" is seen in the fibrillating auricle of man.

The Cinematographic Appearance of Experimentally Produced Auricular Fibrillation.—Detailed study of cinematographs from experimental animals shows that the chaotic activity in the fibrillating auricle ranges from heterorhythmic contractions and dilatations of microscopic muscle segments to relatively rhythmic contraction and relaxation waves which travel measurable distances along variable pathways over the shimmering surface of the auricle (fig. 2). For purposes of description, these two orders of activity have been termed "M" or microscopic and "L," large or macroscopic activity. Both "M" and "L" activity occur simultaneously throughout all contractile portions of the auricular musculature.

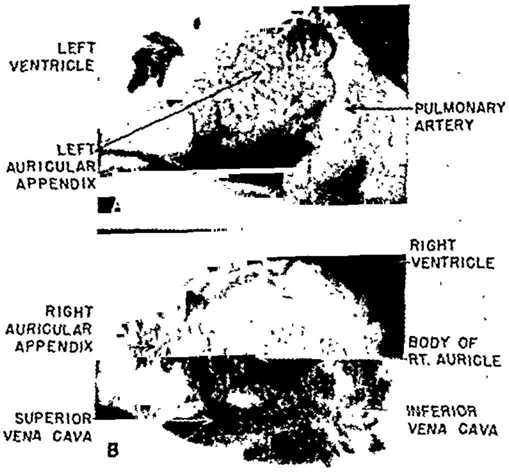

Fig. 2.—Still photographs from motion pictures of auricular fibrillation of (*A*) the left and (*B*) the right auricles in the dog. The numerous minute ("M") contractions are most prominent in the appendices.

"M" activity was observed most clearly in cinematographs of an area of the auricle approximately 1 cm. square photographed under powerful illumination and with a special magnifying lens. Contracting muscle segments as small as 0.2 to 0.8 mm. in diameter could be identified in the films. These segments appeared to contract asynchronously at rates generally between 800 and 1,500 per minute. "M" activity is diagnostic of auricular fibrillation; nothing similar is seen in normal sinus rhythm or in any of the other auricular arrhythmias.

Since "M" activity is not visible to the naked eye, the gross appearance of auricular fibrillation is due to the presence of the macroscopic ("L") contraction and relaxation waves which occur simultaneously with and superimposed on the sea of microscopic ("M") contractions and dilatations. "L" waves arise at a relatively regular rate of approximately 400 to 600 per minute even when electrical shocks are sent into the auricle at a much more rapid rate. Unlike the waves of the other auricular arrhythmias, the "L" waves of fibrillation appear to be independent of the ectopic focus; they arise at various sites on the auricles and travel in variable directions, regardless of the site of stimulation from which the arrhythmia is produced. The distance covered by the "L" waves is variable; some are scarcely visible to the naked eye, while others involve almost the entire auricle. The distinction between "M" activity and the weakest "L" waves is arbitrary; this suggests that the macroscopic waves merely represent fusion of the microscopic contractions and dilatations.

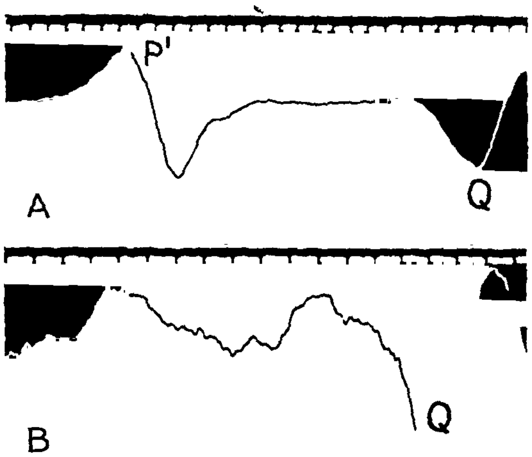

Fig. 3.—Esophageal lead cathode ray oscillograms from a single patient. *A*, during auricular flutter. The baseline is smooth at all times. *B*, after conversion to auricular fibrillation. Activity characteristic of the arrhythmia is now present. Time marker 1/120 second.

The presence of a circus movement as hypothesized by Lewis would be clearly manifested in high speed cinematographs of the fibrillating auricles. Minute circus movements occurring in microscopic areas of the auricles would be visible in the films recorded under high magnification which were used for exploration of the nature of "M" activity. Not only did the cinematographs fail to show any evidence of a circus movement, either macroscopic or microscopic, but several of the observations noted are entirely incompatible with the existence of such phenomena. (1) When both auricles were photographed simultaneously, they were seen to contract at the same time, or either one slightly before the other, or either one many times more frequently than the other. If a circus movement were present, one auricle would always contract before the other, and the number of over-all contractions of the two auricles would be the same. (2) The course pursued by the more vigorous "L" waves was clearly visible in the cinematographs. These waves often involved the entire width of the auricle from the auriculoventricular groove to the intercaval region. They did not turn around the venae cavae as hypothesized by Lewis, nor did they give rise to centrifugal daughter waves. (3) The observation that microscopic contractions and dilatations are present at all times in the fibrillating auricles is incompatible with the existence of an "excitable gap," which is an essential assumption of the circus movement theory. The conclusion is inevitable that no circus movement occurs in auricular fibrillation.

ELECTRICAL ACTIVITY IN THE FIBRILLATING AURICLE

Oscillographic studies of the fibrillating auricle in man and experimental animal confirm the observations made by means of the high speed cinematograph: Electrically as well as mechanically, auricular fibrillation is characterized by rapid, continuous, asynchronous activity of varying strength occurring at irregular rates. No evidence of a circus movement is seen in oscillograms of auricular fibrillation in either man or experimental animal.

Esophageal Lead Oscillogram of Clinical Auricular Fibrillation.—Esophageal lead oscillograms recorded from electrodes directly posterior to the fibrillating auricles in man differ from comparable tracings of the other auricular arrhythmias in several essential respects. No P′ wave is present.[15] The baseline throughout the tracings is irregular and jagged. The frequency, amplitude, and configuration of the deflections is extremely variable (fig. 3). Simultaneously recorded oscillograms from various auricular levels exhibit little or no synchronism. Two extreme orders of electrical activity, presumably the counterparts of the "M" and "L" activity observed in the cinematographs, may be distinguished in esophageal lead oscillograms of clinical auricular fibrillation. (1) Minute complexes of constantly changing configuration, generally 0.1 mv. or less in amplitude, are inscribed at frequencies up to several thousand per minute. (2) Large complexes, approximately 0.2 to 1.0 mv. in amplitude, occur at frequencies af about 350 to 600 per minute. These large complexes correspond to the familiar "f" waves of the fibrillation electrocardiogram.

Direct Lead Oscillogram of Experimentally Produced Auricular Fibrillation.—Except for differences directly attributable to the difference in location of the recording electrodes, the direct lead oscillogram of auricular fibrillation in the experimental animal is similar to the esophageal lead oscillogram of the clinical arrhythmia. No P′ wave is present; no isoelectric period is recorded (fig. 4); no synchronism between simultaneously recorded tracings is apparent. As in the esophageal lead oscillogram, both minute and large complexes are recorded from all regions of the auricles. Because of the greater proximity of the recording electrode, however, the deflections inscribed in the direct leads exhibit a wider range of sizes and frequencies than do those in the semidirect leads. (1) Minute complexes, an estimated 50 to 500 μv. in amplitude, occur at the astonishingly high frequency of approximately 7,000 to 20,000 per minute. Such deflections are too weak and too rapid to be recorded by standard electrocardiographic equipment. (2) Large complexes, corresponding to the "f" waves of the electrocardiogram, vary from 3 to 10 mv. in potential and are inscribed at rates from 500 to 1,000 per minute. An intermediate type of complex, varying from an estimated 0.5 to 3 mv. in potential, was frequently recorded from the appendix. The electrical activity represented by the intermediate complexes probably is responsible for the grass-like baseline and irregularities of the "f" waves seen in limb lead electrocardiograms of clinical auricular fibrillation.

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[15] The presence of a P′ wave in auricular flutter has been demonstrated.

The chaotic nature of the electrical activity manifested in oscillograms of auricular fibrillation is incompatible with the existence of a circus movement. If a single excitation wave traveled around the fibrillating auricles along a roughly circular path, as hypothesized by Lewis, some type of synchronism would be present in simultaneously recorded leads from various sites on or near the circuit. Although direct auricular and esophageal lead oscillograms were recorded simultaneously from numerous combinations of electrode positions, in every instance the tracings were entirely or almost entirely asynchronous. Furthermore, the absence of isoelectric intervals in the oscillogram indicates that the "isoelectric gap," which is essential to the perpetuation of the circus movement, does not exist.

EFFECT OF DRUGS ON THE FIBRILLATING AURICLE

The fact has long been known that auricular fibrillation is produced when the auricular rate reaches a certain critical level, called the fibrillation threshold rate. High speed cinematographs and cathode ray oscillograms recorded while the auricles are electrically stimulated at gradually increasing rates reveal that certain manifestations of conduction failure appear before the fibrillation threshold is reached, grow progressively more pronounced, and finally culminate in the chaotic mechanical and electrical activity characteristic of auricular fibrillation. As the accelerating rate of discharge from the ectopic focus approaches the fibrillation threshold, the contraction waves seen in the cinematographs are conducted over the auricles at progressively slower rates so that each wave leaves the ectopic focus a shorter interval after the preceding wave has terminated, and the length of auricular diastole is consequently shortened. The electrical counterpart of this mechanical phenomenon is a progressive lengthening of the stimulus-to-intrinsic interval and a slight notching and splintering of the auricular deflection indicative of a slowing of the rate of conduction of the excitation wave. Such conduction slowing is attributable to incomplete conduction recovery during the shortened cardiac cycle and reduced period of auricular diastole. Thus, as a result of these two factors—slowing of conduction and shortening of diastole—the auricular musculature has increasingly less time in which to recover its ability to conduct succeeding excitation and contraction waves. Auricular fibrillation ensues when the rate of discharge from the ectopic focus reaches a level at which conduction is so impaired and diastole so short that the auricle is unable to recover from one contraction and excitation process rapidly enough to receive and conduct the succeeding wave in a coordinated fashion.

The above observations indicate that the fibrillation threshold of a given auricle is determined by the conductivity of the auricular musculature. This conclusion is supported by the observation that the rate of stimulation required to produce fibrillation is lowered after administration of quinidine or digitalis, both of which have been shown to depress auricular conductivity by delaying conduction recovery.[14] Conversely, a more rapid rate of stimulation is required to obtain fibrillation after than before administration of acetylcholine, a drug that has been shown to accelerate auricular conduction recovery and to improve auricular conductivity.

Since auricular fibrillation occurs when the rate of discharge from an ectopic focus on the auricles reaches the fibrillation threshold, and since the fibrillation threshold is determined by the conductivity of the auricular musculature, the effect of a given agent on the fibrillating auricle depends on its ability to alter the activity of the ectopic focus and/or auricular conductivity.[16] The action of the various antifibrillary drugs does not occur at an "excitable gap" on a hypothetical circus pathway. Rather, any agent that decreases the rate of discharge from the ectopic focus and/or facilitates auricular conductivity will tend to terminate auricular fibrillation. Any agent that increases the rate of discharge from the focus and/or depresses auricular conductivity will tend to precipitate or perpetuate auricular fibrillation. In the present study, the same methods of direct observation used to explore the mechanism of auricular fibrillation were further applied to determine the precise effects on the fibrillating auricle of the two commonest therapeutic agents, quinidine and digitalis.

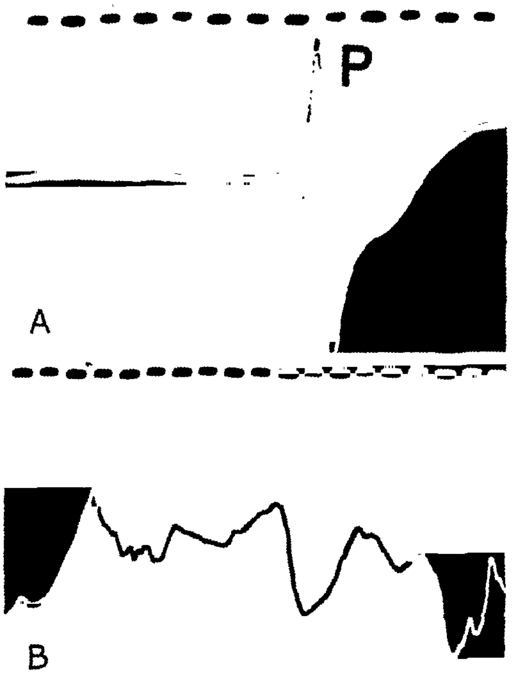

Fig. 4.—Direct auricular lead cathode ray oscillograms from a dog. *A*, regular sinus rhythm. Note the smooth baseline. *B*, after the production of auricular fibrillation, the activity has changed completely. Time marker 1/120 second.

Effect of Quinidine on the Fibrillating Auricle.—Both cinematographically and electrocardiographically, quinidine was found to depress conduction in an auricle beating at any specific controlled rate and thereby to lower the fibrillation threshold. When administered during auricular fibrillation, quinidine proved capable of slowing the rate of discharge from the ectopic focus and thereby terminating the arrhythmia.

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[16] Since the ectopic focus of auricular fibrillation lies in cardiac muscle, the possibility exists that any agent that drastically depresses auricular conductivity would tend to prevent the conduction of impulses out of the ectopic focus and consequently would slow the rate of discharge from the focus.

As noted earlier, manifestations of conduction failure appear in the auricle before the onset of fibrillation and grow progressively more pronounced as the rate of discharge from the ectopic focus is increased. High speed cinematographs of aconitine-produced auricular fibrillation recorded during administration of quinidine exhibit the reverse of this process: The quinidine-induced slowing of the rate of discharge from the focus is accompanied by an improvement in auricular conduction which outweighs the direct conductivity-depressing action of the drug. After quinidine is administered, the "L" contraction and relaxation waves in the fibrillating auricle gradually become stronger and travel greater distances. The "M" activity progressively decreases in rate and exhibits increasing coordination. As the auricular rate drops below the fibrillation threshold, the "M" activity disappears and the waves are seen to initiate from a single site and travel across the entire contractile surface of the auricle. Further slowing of the rate of discharge from the ectopic focus is marked by an increase in the regularity and rate of conduction of the contraction waves.

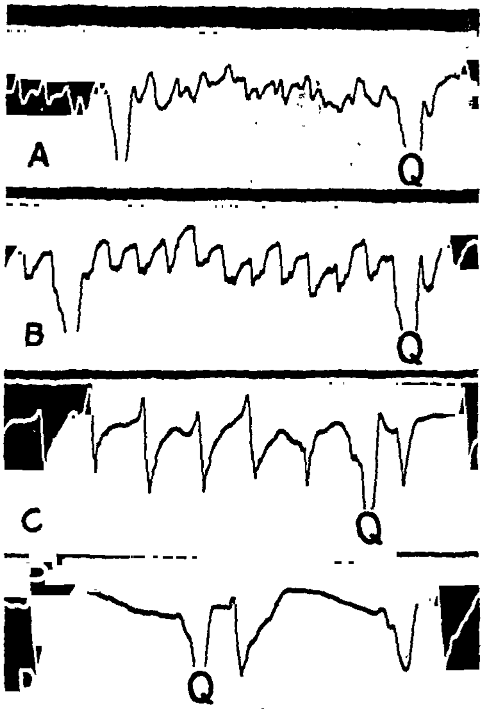

Fig. 5.—Direct auricular lead oscillogram from a dog exhibiting transitions from fibrillation to auricular tachycardia induced by quinidine (time markers 1/120 second). *A*, untreated fibrillation. *B*, fibrillation immediately following quinidine. The oscillations occur at a slightly slower rate than in *A* and bear some resemblance to one another. *C*, intermediate stage in the transition from fibrillation to flutter. Note the increased amplitude and decreased rate of the deflections. Aberration of the P' wave is pronounced. *D*, auricular tachycardia. The P'-Q interval is prolonged.

The electrical counterpart of these mechanical changes is observed in direct lead oscillograms from the fibrillating auricle of the dog recorded during quinidine administration. After administration of the initial dose, the large complexes in the oscillogram exhibit a gradual increase in amplitude and decrease in frequency, as well as somewhat greater regularity in rate and configuration. The minute complexes grow progressively smaller until, after additional quinidine is received, they disappear from the tracings, and the baseline between the large complexes becomes smooth. As the auricular rate drops below the fibrillation threshold and continues to decline, the chaotic pattern of fibrillation is often replaced by the regular and symmetrical auricular deflections of flutter, tachycardia, and finally by normal sinus rhythm. The large complexes in simultaneously recorded direct lead oscillograms exhibit increasing synchronism after the initial dose of quinidine is injected, culminating in the achievement of complete synchronism with the onset of flutter or a slower-rate rhythm (fig. 5). This sequence of events often occurs clinically after quinidine.[17] In our experiments, the sequence of events leading to the termination of auricular fibrillation by quinidine was often cinematographically and electrographically similar to that observed when the rate of discharge from an aconitine-produced focus is slowed by direct cooling. If the rate of discharge from the ectopic focus declines suddenly to below the rate from the sinus node, direct conversion to normal sinus rhythm is achieved. If the rate from the focus falls gradually, flutter and/or tachycardia may appear before normal rhythm is restored.

Effect of Digitalis on the Fibrillating Auricle.—Digitalis, like quinidine, depresses auricular conduction at rapid auricular rates and thereby lowers the fibrillation threshold. Unlike quinidine, which has an atropine-like effect, digitalis causes an increase in vagal tone, which largely determines its effect on the rate of discharge from the ectopic focus. In clinical and experimentally produced auricular arrhythmias, both digitalis and vagal stimulation usually decrease the rate of discharge from an ectopic focus which is discharging relatively slowly, as in paroxysmal auricular tachycardia. Both measures tend to increase the rate of discharge from the ectopic focus when the auricular rate is rapid, as in flutter and fibrillation. Digitalis, therefore, tends to convert flutter into fibrillation and to perpetuate fibrillation.

The effect of digitalis on the electrical activity in the fibrillating auricle was observed in direct lead oscillograms from experimental animals and in esophageal lead oscillograms from human subjects. In the experimental animal, tracings recorded during digitalization show a progressive decline in amplitude and increase in rate of the large auricular complexes, with a smoothing of the baseline between ventricular complexes. In man, as in dog, the amplitude of the large complexes was greatly reduced after digitalization, and the baseline between ventricular complexes was smoother than before treatment (fig. 6). The decrease in auricular electrical activity is seen in the electrocardiogram of patients with auricular fibrillation who have been freely digitalized.[18]

High speed cinematographs of the fibrillating auricle taken after digitalization reveal a distinct reduction in auricular size. In addition, the fibrillatory movements are greatly diminished, and the large contractions appear to be restricted.

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[17] Sokolow, M.: Quinidine in the Treatment of Benign Auricular Fibrillation with Repeated Emboli, Am. Heart J. **18**: 497, 1939.

[18] Hart, T. S.: Quinidin in Auricular Fibrillation, Arch. Int. Med. **30**: 593 (Nov.) 1922.

Many questions concerning the effects of drugs on the fibrillating auricle remain unanswered. The precise pharmacologic action responsible for the ability of quinidine to decrease the rate of discharge from an ectopic focus has not yet been established. Why digitalis and vagal stimulation usually slow the activity of an ectopic focus during tachycardia but tend to increase the activity of the focus during flutter and fibrillation is unknown. These and many other unsolved problems concerning auricular fibrillation and the slower rate auricular arrhythmias are now under investigation. At present, this much may be stated: Direct observation in man and dog establishes that auricular fibrillation represents an advanced degree of conduction failure which occurs when the rate of discharge from the ectopic focus reaches a certain critical level. Since no circus movement is present in the fibrillating auricle, termination of the arrhythmia is not achieved by the interruption of an "excitable gap" on a circus pathway. Rather, fibrillation ceases when the degree of conduction failure is reduced sufficiently to permit orderly conduction of contraction and excitation waves from the ectopic focus to the extremities of the auricles. This concept, together with a knowledge of the pharmacology of currently available drugs, provides a more rational basis for the therapy of auricular fibrillation than any heretofore advanced.

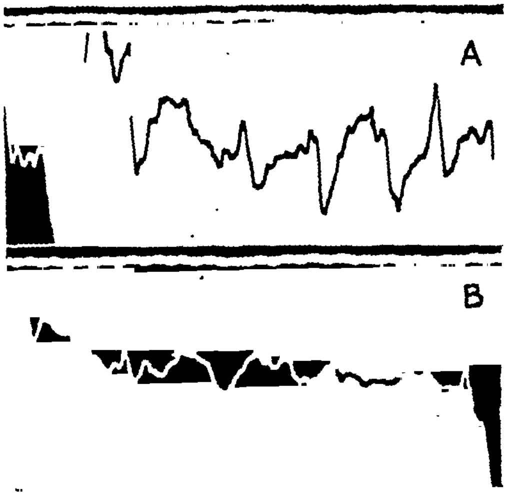

Fig. 6.—Direct auricular lead oscillogram from a dog showing auricular fibrillation. *A*, before digitalization. *B*, after digitalization. After digitalization, the oscillations are of decreased amplitude and appear to occur at a more rapid rate. (Time marker 1/120 second).

SUMMARY AND CONCLUSIONS

Direct and extensive observation of the fibrillating auricle in man and experimental animal establishes that previous theories concerning the mechanism of auricular fibrillation are invalid.

The mechanical and electrical activity in clinical auricular fibrillation is similar to that observed in the experimentally produced arrhythmia.

The motion of the fibrillating auricle was directly visualized in high speed color cinematographs of the exposed heart recorded in human subjects during surgical removal of auricular appendix and in experimental animals during bouts of fibrillation produced by local application of aconitine or electrical stimulation. In both man and experimental animal, the cinematographs revealed the presence of chaotic, continuous, rapid mechanical activity of a type never before described. Microscopic muscle bundles throughout the contractile portions of the auricular musculature undergo rapid and heterorhythmic contractions which cause a constant change in the silhouette and surface configuration of the fibrillating auricle. Superimposed on the microscopic contractions, relatively rhythmic contraction and relaxation waves arise at various sites on the auricle and travel for measurable distances in variable directions. No evidence of a circus movement, either macroscopic or microscopic, is visible in cinematographs of the fibrillating auricle of man or experimental animal.

Cathode ray oscillograms of auricular fibrillation recorded from direct auricular leads in experimental animals and from esophageal leads in man demonstrate the presence of chaotic, continuous, noncyclic electrical activity occurring in all portions of the auricles and corresponding to the microscopic and macroscopic mechanical events visualized in the cinematographs. Minute complexes of variable configuration are inscribed throughout the oscillograms at exceedingly rapid and highly irregular rates. The electrical events represented by such complexes are not recorded by standard electrocardiographic equipment. Larger complexes, also of variable configuration but lower in frequency and less irregular in rate than the minute complexes, are recorded from all areas of the auricles. Simultaneously recorded oscillograms from various combinations of sites on the fibrillating auricles exhibit little or no synchronism. The chaotic and continuous nature of the electrical activity in auricular fibrillation is incompatible with the existence of a circus movement.

Cinematographic and oscillographic study of the onset of auricular fibrillation indicates that the arrhythmia represents an advanced degree of conduction failure which occurs when the rate of discharge from the ectopic focus is too rapid to permit adequate conduction recovery in the auricle between successive contraction and excitation processes. Any agent that reduces the degree of conduction failure either by slowing the rate of discharge from the ectopic focus or by improving auricular conductivity tends to terminate auricular fibrillation. The therapeutic action of antifibrillary drugs is not due to an alteration of an excitable gap on a circus pathway.

Direct observation of the effects of quinidine and digitalis on the fibrillating auricle shows that both agents depress auricular conductivity at rapid auricular rates and thereby lower the fibrillation threshold. The antifibrillary action of quinidine is related to the ability of the drug to slow the rate of discharge from an ectopic focus on the auricles and consequently to mitigate the conduction failure induced by rapid auricular rate. Digitalis generally increases the rate of discharge from the rapidly discharging focus in the fibrillating auricle and consequently tends to perpetuate auricular fibrillation.

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VENTRICULAR TACHYCARDIA

REPORT OF A CASE IN WHICH "PRONESTYL" WAS EFFECTIVELY USED AFTER FAILURE WITH QUINIDINE

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and
Frank B. Cutts, M.D., Providence, R. I.

Recently we have observed the occurrence of ventricular tachycardia in a young man, approximately three months after myocardial infarction. Esophageal leads were helpful in proving the diagnosis. Although the arrhythmia was refractory to large amounts of quinidine sulfate (by oral and intravenous administration), atropine, magnesium sulfate, and diethylaminoethanol, it finally responded, with the patient almost at the point of death, to oral administration of procaine amide hydrochloride ("pronestyl").

REPORT OF A CASE

J. A. B., a white man, 35, was admitted to the Rhode Island Hospital on March 3, 1950. His symptoms, physical findings, laboratory studies, and serial electrocardiograms indicated an acute anteroseptal myocardial infarction. No arrhythmias were noted during daily examinations and his course was benign. He was not given quinidine or digitalis, and was discharged on the 31st day, on limited but increasing activities.

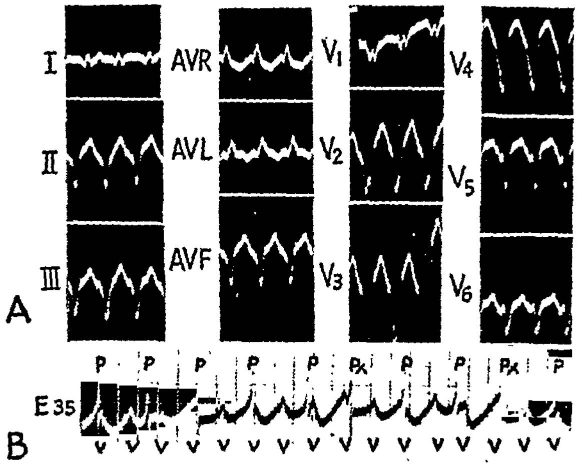

Fig. 1.—*A*, electrocardiogram made on admission. Ventricular tachycardia. Rate 190. *B*, esophageal lead at 35 cm. P indicates auricular complexes (rate 110); Px, auricular extrasystoles; V, ventricular complexes.

He remained entirely asymptomatic until 48 hr. before his second admission, on June 11, 1950 (53 days after discharge, and 86 days after the onset of infarction). At this time he had been awakened by vague left chest and shoulder pain and simultaneous palpitation. The attack subsided spontaneously after four hours, only to recur 24 hr. later. Despite narcotics, the tachycardia and pain persisted and he was rehospitalized.

Physical Examination.—The blood pressure was 104/80; pulse rate, 168; respirations, 24; rectal temperature, 101.6 F. He was sweating, slightly dyspneic, apprehensive, and acutely ill. Rales and crackles were heard at both lung bases, more marked on the right. The heart was not enlarged. The sounds were clear and perfectly regular. A loud to-and-fro friction rub appeared and lasted a few hours on the second day. The liver was not palpable and results of physical examination were otherwise not remarkable.

Laboratory Studies.—Results of laboratory studies showed a white blood cell count of 15,250 per cubic millimeter and a sedimentation rate of 38 mm. per hour. Chest x-rays showed moderate pneumonitis at the right base. An electrocardiogram made on admission, with esophageal leads made on the following morning, was diagnostic of ventricular tachycardia (fig. 1). The clinical impression was bronchopneumonia with ventricular tachycardia, and probably pericarditis. A small recurrent myocardial infarction could not be excluded.

Treatment and Course.—Bishydroxycoumarin (dicumarol®) and penicillin were given in adequate doses. Figure 2 summarizes the treatment with quinidine and procaine amide hydrochloride ("pronestyl") during the tachycardia. Severe diarrhea was noted on the first trial with quinidine, and on the second day vomiting and diarrhea were so severe (after 3.0 gm. in eight hours) that further quinidine sulfate by mouth was omitted. Atropine sulfate (1.6 mg. intravenously) given at the height of quinidine effect was of no avail. An electrocardiogram suggested moderate quinidine toxicity (fig. 3). On the third day magnesium sulfate (20 cc. of 25% solution) administered intravenously was of no value, and later, diethylaminoethanol (5.6 gm. intravenously administered in one hour) did not slow the rate significantly or alter the electrocardiogram. Because the patient showed gradual and progressive deterioration, intravenous quinidine (1.95 gm. quinidine lactate diluted to 200 cc. with 5% dextrose in water) was given on the fourth day. After approximately two-thirds of the solution had been given during a 40-min. period, severe vomiting and a short convulsive seizure occurred. The rate of administration was slowed for 10 min. and then stopped for 15 min. because of protracted vomiting. After resumption of use of the drug, tachypnea, profuse sweating, flushing, generalized weakness, and drowsiness became prominent. Although the ventricular rate was slowed moderately, the electrocardiograms (made every five minutes) were, in rate and contour, almost exactly like those seen after oral administration of quinidine. The toxic effects of the drug were felt to be too severe to permit further use.

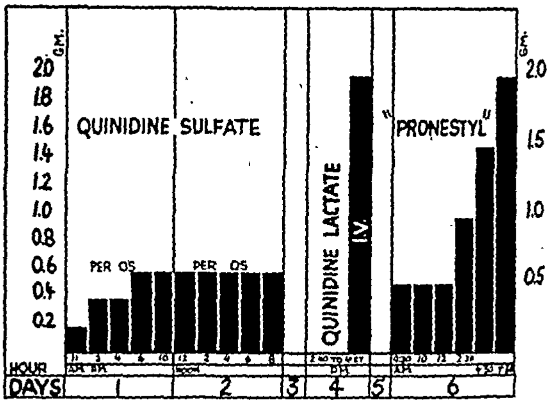

Fig. 2.—*A summary of the treatment with quinidine and procaine amide hydrochloride ("pronestyl") during hospital admission for tachycardia.*

On the sixth day the patient suddenly became worse, shock appeared, and he was not expected to live more than a few hours. "Pronestyl" (procaine amide hydrochloride) became available for the first time, and was given as shown in Figure 2. The patient remained in critical condition until, 12 hrs. after he was given the drug, the rhythm reverted. An electrocardiogram made shortly after the last dose showed severe quinidine-like effects (fig. 3). After reversion a dramatic improvement occurred, and the fol-

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From the Heart Station, Rhode Island Hospital. Dr. Irvin is a trainee of the National Heart Institute.

E. R. Squibb & Sons, New York, N. Y., supplied "pronestyl" for therapeutic trial.

lowing morning the blood pressure was 104/82 and the skin was warm and dry. An electrocardiogram showed normal sinus rhythm and, again, changes similar to those seen with quinidine (fig. 4).

Procaine amide hydrochloride, 500 mg., was continued every fourth hour, and gradual clinical improvement was observed. Forty-eight hours after reversion, runs of bigeminal rhythm were noted, and the drug was increased to 1 gm. every four hours. It is of interest that the ventricular extrasystoles were different in form from the QRS complexes during the tachycardia, and thus presumably arose from a different focus. The bigeminy (fig. 4) became more persistent, and the patient noted a generalized flushed sensation, and later mild nausea, following a single dose. The nausea disappeared quickly and the flushed sensation decreased in intensity when the drug was continued at the same dosage. The administration of procaine amide hydrochloride was maintained at 1 gm. every four hours for six days, and the rhythm became slow and regular. Then the dosage was reduced gradually, and terminated 10 days later. When the dosage was reduced to 250 mg. every four hours, a moderate number of ventricular extrasystoles (as many as to 14 a minute) reappeared. These caused no symptoms, and the tachycardia did not recur. The patient was discharged, feeling well, on the 31st hospital day.

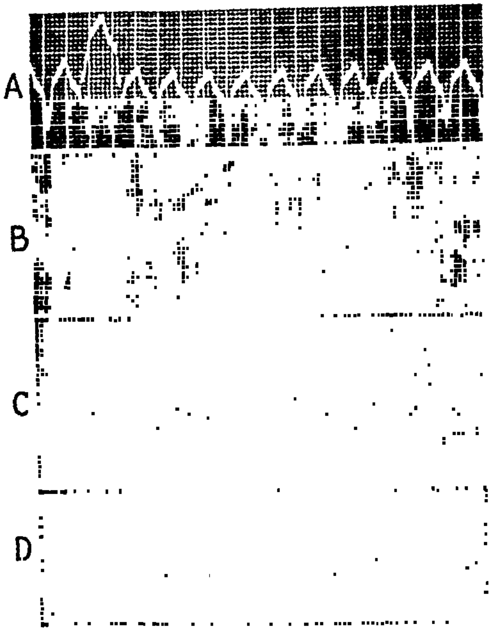

Fig. 3.—All tracings in Lead II. *A*, before treatment. Rate 190. *B*, after 3.0 gm. of quinidine sulfate by oral administration over a period of eight hours. Rate 133. Some widening of QRS complexes. *C*, thirty-six hours after intravenous quinidine. Rate 178. QRS complexes similar to those in *A*. *D*, just after 6 gm. of procaine amide hydrochloride ("pronestyl") given in 10-hr. period by mouth. Rate 112. QRS complexes considerably widened.

COMMENT

"Pronestyl"—procaine amide hydrochloride—(p-amino-N-[2-diethylaminoethyl] benzamide hydrochloride), a derivative of procaine, has been studied intensively by Mark and others,[1] and has been found to be particularly useful for the treatment of ventricular tachycardia. It may be successful when quinidine has failed, and has minimal toxic effects in therapeutic doses. The drug may be given by mouth or intravenously (100 mg. per cubic centimeter). As in this case, quinidine-like effects may be noted in the electrocardiogram following its use. Procaine amide hydrochloride appears to be a useful drug in treating ventricular tachycardia.

SUMMARY

A proved case of ventricular tachycardia refractory to quinidine was reverted with "pronestyl" (procaine amide hydrochloride). Procaine amide hydrochloride has an action similar to quinidine on ventricular muscle, but apparently does not exhibit the toxic effects of the latter drug. The drug appears to be effective in ventricular tachycardia and deserves further trial.

ADDENDUM

This patient's course, since this report was submitted, is of interest. One week after discharge, he was readmitted with a second bout of ventricular tachycardia (electrocardiogram tracing as in Fig. 1). This was again controlled by oral administration of procaine amide hydrochloride ("pronestyl") although he vomited considerably when it was administered. He was discharged on July 28, 1950, and instructed to take 1 gm. of the drug on arising and at bedtime, and 0.5 gm. every three hours during the day. He was examined on three occasions thereafter in the outpatient clinic. He reported one short bout of tachycardia, readily controlled by an extra dose of procaine amide hydrochloride, but complained of occasional nausea after taking the drug and could not take larger amounts routinely. Occasional-to-numerous extrasystoles were noted at each visit.

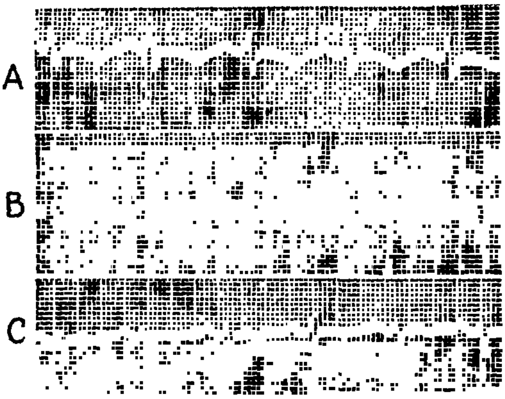

Fig. 4.—All tracings in Lead II. *A*, shortly after tracing shown in Figure 2*D*. Normal sinus rhythm. Rate 75. *B*, ventricular extrasystoles while procaine amide hydrochloride ("pronestyl"), 1 gm. every four hours, was being given. These were more clearly shown to be ventricular extrasystoles in other leads and differed from the complexes seen during the tachycardia. *C*, two days after all medication was stopped.

On Sept. 12, 1950, he died suddenly after a bout of palpitation, which his family said was similar to his previous attacks. Autopsy, limited to the heart, revealed an old thrombosis in the anterior descending branch of the left coronary artery, and a large healed infarct involving the anterior left ventricle and the anterior two-thirds of the interventricular septum. In this case it seems apparent that ventricular irritability was persistent over a three-month period. Although procaine amide hydrochloride was successful in terminating at least two attacks of ventricular tachycardia, it did not prevent, in tolerated dosage, ventricular extrasystoles or what was apparently a fatal arrhythmia.

124 Waterman St. (Dr. Cutts).

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[1] Mark, L. C.; Berlin, I.; Kayden, H. J.; Rovenstine, E. A.; Steele, J. M., and Brodie, B. B.: The Action of Procaine Amide (N¹-[2-Diethylaminoethyl]-P-Aminobenzamide) on Ventricular Arrhythmias, abstracted, J. Pharmacol. & Exper. Therap. 98: 21 (Jan.) 1950.

BALLISTOCARDIOGRAPHY IN MEDICAL PRACTICE

William Dock, M.D., Harry Mandelbaum, M.D.
and
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Seventy years elapsed between the description by Gordon[1] of a method for graphically recording the motion of the body with each heart beat and Starr's Harvey Lecture[2] reporting how such curves could be used in routine clinical diagnosis. Most ballistocardiographs are bulky; the latest model to be described weighs over a ton without the recording mechanism.[3] However, since 1949 there have been available three systems for recording the body's motion with very simple attachments to any type of electrocardiograph,[4] and routine use by practitioners, industrial medical and insurance examiners has become a reality. Physicians not only use the ballistocardiograph on patients, but have it used on themselves as they enter the "coronary age." It therefore is desirable to put before them a brief description of this simple diagnostic method.

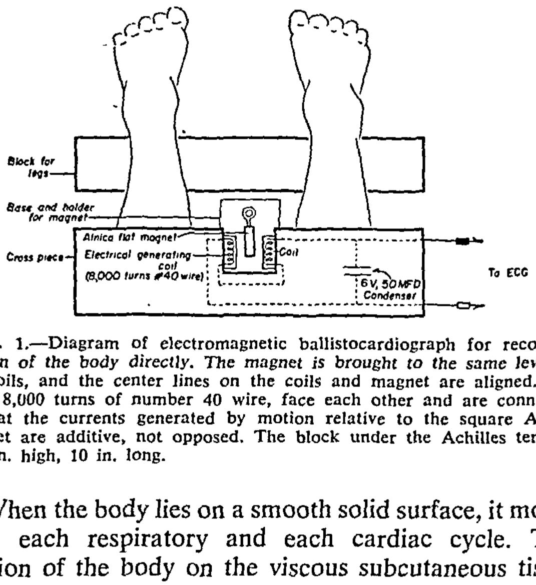
Block for legs
Base and holder for magnet
Alnico flat magnet
Cross piece
Electrical generating coil (8,000 turns #40 wire)
Coil
6V, 50MFD Condenser
To ECG

Fig. 1.—Diagram of electromagnetic ballistocardiograph for recording motion of the body directly. The magnet is brought to the same level as the coils, and the center lines on the coils and magnet are aligned. The coils, 8,000 turns of number 40 wire, face each other and are connected so that the currents generated by motion relative to the square Alnico magnet are additive, not opposed. The block under the Achilles tendons is 3 in. high, 10 in. long.

When the body lies on a smooth solid surface, it moves with each respiratory and each cardiac cycle. This motion of the body on the viscous subcutaneous tissue can be recorded by the change in width of a shadow cast by the body on a photocell, by pressure of the body against any device for recording pulses, or by motion of a coil attached to the body and placed in the field of a magnet fixed to the earth.[4] Likewise, the pull of the body transmitted through the subcutaneous tissues to the table on which it lies can be recorded in many different ways. Both high frequency and critically damped, low frequency, table type ballistocardiographs are too bulky for routine use. After much experience with other methods, we have chosen a two coil electromagnetic pick-up, which lies across the shins, as the most dependable, the lightest, and least bulky. It contains no elements, such as batteries, that require replacement. Curves taken with this instrument on subjects lying on the Starr table are almost identical with those inscribed by the table. Since the flat fixed magnet is placed between the coils, the variation due to slight change in magnet-coil distance inherent in our previous single coil models has been eliminated. The instrument has one great defect—it is so simple and cheap that no manufacturer has found it worthwhile to make. A diagram (fig. 1) has been useful to several dozen physicians who have made their own ballistocardiographs.

INTERPRETATION OF THE CURVES

Our understanding of the significance of the deflections is due to the experiments of Hamilton[5] and Starr.[6] When the viscera or rib cage moves with respiration, the body moves in the opposite direction (Newton's third law: to every action, there is an equal and oppposite reaction). Since the rib cage moves headward and the viscera footward, the ballistopneumogram depends on the type of respiration. Our ballistocardiograph is designed to filter out the respiratory component except for a very slight change in baseline. Unfiltered photoelectric pick-ups or the low frequency tables show respiratory waves far larger than those of the cardiac cycle; these are absent in unfiltered electromagnetic recording or with high frequency tables.[3]

The ballistocardiographic waves result from recoil from ventricular ejection, which pushes the body footward, and impact or deceleration of blood moving in the great vessels, which moves the body in the same direction as the blood. Both types of force may operate at one time, and the ballistocardiograph records the motion due to the balance of all these forces. In any case, the force equals mass times square of velocity of the blood. If stroke volume is constant, but mean velocity doubled when the duration of systole is halved, the ballistic forces will be increased fourfold; if systole is prolonged by 29%, the ballistic forces will be halved. The size of the ballistic waves, therefore, will vary with stroke volume only when diastolic pressure, aortic elasticity, and myocardial vigor are constant, and the size of the waves cannot be used as an index of stroke volume in the presence of heart disease, very high or low diastolic pressures, or disease of the aorta.[6] A young man with aortic insufficiency shook the bed at each heart beat, and his I-J wave was 10 times the normal amplitude and could be inscribed only with a fivefold decrease in sensitivity of the

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From the Department of Medicine, State University of New York, College of Medicine.

[1] Gordon, J. W.: *On Certain Molar Movements of the Human Body Produced by the Circulation of the Blood,* J. Anat. & Physiol. **11:** 533 (April) 1877.

[2] Starr, I.: The Ballistocardiograph: An Instrument for Clinical Research and for Routine Clinical Diagnosis, Harvey Lec. (1946-1947) **42:** 194, 1947.

[3] Braunstein, J. R.; Oelker, C. E., and Gowdy, R. C.: Design of a 2-Dimensional Ballistocardiograph, J. Clin. Investigation **29:** 1219 (Sept.) 1950.

[4] Dock, W., and Taubman, F.: Some Technics for Recording the Ballistocardiogram Directly from the Body, Am. J. Med. **7:** 751 (Dec.) 1949.

[5] Hamilton, W. F.; Dow, P., and Remington, J. W.: Relationship Between Cardiac Ejection Curves and Ballistocardiographic Forces, Am. J. Physiol. **144:** 557 (Sept.) 1945.

[6] Starr, I.; Horwitz, O.; Mayock, R. L., and Krumbhaar, E. B.: Standardization of the Ballistocardiogram by Simulation of the Heart's Function at Necropsy: With a Clinical Method of the Estimation of Cardiac Strength and Normal Standards for It, Circulation **1:** 1073 (May) 1950.

galvanometer, yet it is unlikely that the total output of both ventricles was more than twice normal. In shock, I-J is relatively large in relation to stroke volume, because diastolic pressure is low.

The normal curve (fig. 2A) has three main systolic waves: I, a footward wave when ejection begins; J, a headward wave when impact on the arch of the aorta predominates, and K, a footward wave due to deceleration as the main mass of blood moves down the aorta. L and N, headward waves sometimes fused into a single wave, occur in early diastole. H, a headward wave, usually occurs during isometric contraction at the onset of systole, but with long P-R intervals or presystolic gallop, it may begin before the Q wave of the electrocardiogram, and at fast rates, N and H may be fused into a single presystolic wave ending in early systole.

During respiration, there may be as much as 40% decrease from the maximal amplitude in the I-J waves of normal subjects, and reciprocal changes in the height of I and J also occur. Decrease in vigor of ventricular contraction, with constant stroke volume and diastolic pressure, leads to decrease in I-J, notching of J, and increased depth of K.[6] In coarctation of the aorta without heart failure, in shock, and in some adults with systolic pressures below 110 mm. Hg., K is absent or distinctly reduced. While L may rarely be as high as J in normal subjects, it often is prolonged and tall in mitral stenosis and in cases of gallop rhythm.

There are no ballistocardiographic curves pathognomonic of specific diagnostic entities, but in North America there is a very high correlation between angina pectoris, myocardial infarction, or scars due to infarction, and curves with pronounced respiratory variation, or complete obliteration of the normal pattern. Such curves also are seen in congestive failure with low cardiac output, but here severe myocardial weakness is already known to be present.

In heart failure, the ballistocardiograph is most useful when it reveals normal or high amplitude waves, always suggestive of aortic insufficiency or high cardiac output and sometimes leading to the discovery of an unsuspected beriberi, toxic diffuse goiter, osteitis deformans, arteriovenous fistula, or cirrhosis of the liver. Anemia with heart failure may be associated with waves that are normal and of great size, but that revert to low, bizarre complexes as hemoglobin levels return to normal. Acute myocarditis is frequently accompanied by decided ballistocardiographic abnormality as the only objective evidence of cardiac involvement. This is less striking when fever is high and blood flow very great. It should be noted that in scarred hearts, the L-M complex in diastole may simulate the normal J-K, which in turn may be so diminished that on inspection of the curve the examiner mistakes systole for diastole. Simultaneous pulse or electrocardiographic traces are thus essential in these cases for correct interpretation of the ballistocardiographic records (fig. 2B).

It is our practice to record the ballistocardiogram after the routine electrocardiograms, with the patient under basal conditions and breathing normally. Further records are made with the breath held in deep inspiration and in deep expiration, and in suspected cardiac cases in which this gives normal records, the sequence is repeated after exercise such as the two step test. It has also been shown[7] that the ballistocardiogram taken after meals is abnormal in some cardiac patients with normal basal ballistocardiograms.

The records are interpreted in the light of what we already know of the patient. Thus deep K waves and pronounced respiratory variation in I-J are normal in the latter half of pregnancy, but may indicate that a hypertensive is on the verge of congestive failure. K waves as short as I, or absent K waves, might mean early shock in a person with bleeding ulcer, fast pulse, and normal pressure, might be normal for a man with familial hypotension, and would corroborate the diagnosis of coarctation in a hypertensive patient with weak or absent femoral pulsations. Notched ribs in the chest roentgenogram would prove that the coarctation was at the usual site. Deep K waves might be due to hypertension, to a rigid aorta, or, when associated with abnormal I-J waves, to heart failure, or severe scarring of the heart. In elderly subjects, varying combinations of all four factors may account for bizarre I-J and deep K waves. Bizarre waves and great respiratory variations are seen in pericardial tamponade.

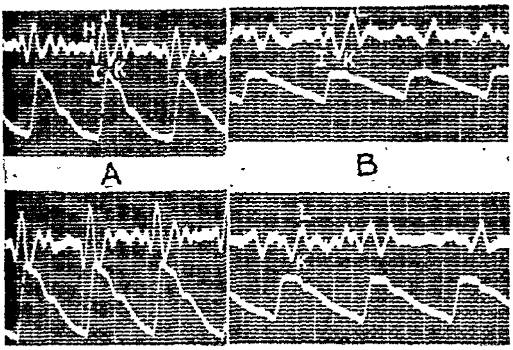

Fig. 2.—In all records, the upper trace is the ballistocardiogram, the lower trace is the radial pulse. *A*, the record from a normal adult at rest (upper pair of tracings) and after exercise (lower pair of tracings). *B*, record from a case of angina. The large L might be mistaken for J, and the extreme abnormality might escape detection, if the waves were not timed by comparison with the pulse. The waves are smaller in the lower record after exercise.

The ballistocardiographic record is read much as one reads the facies of a patient; it is not subjected to quantitative analysis, but is intuitively compared with the normal range for young adults and the variations noted by the observer or reported by others in groups of patients with specific diagnoses. Thus in a patient known to have angina or a previous episode of coronary disease, a normal ballistocardiogram on effort as well as rest is welcome evidence of excellent recovery of myocardial function, but does not rule out subsequent coronary episodes. Gradual return toward normal may continue for months after an infarct, but persistence of chaotic waves would make one suspect myocardial aneurysm, future congestive failure, and a relatively great risk of sudden death. Discovered in a patient with angina or in a person free of all other signs of heart trouble, such a tracing would lead one to give the same advice as in a case of myocardial aneurysm accidentally detected by routine chest roentgenograms. Less pronounced abnormalities would have a significance comparable with that of a deep Q and spiked inverted T, while minor abnormalities would be accepted as evidence of previous injury with minimal residual defect.

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[7] Berman, B.; Braunstein, J. R., and McGuire, J.: The Effect of Meals on the Electrocardiogram and the Ballistocardiogram in Patients with Angina Pectoris, Circulation 1: 1017 (April) 1950.

It must be borne in mind, however, that while small but strategically placed scars can cause such maximal change in the electrocardiogram as bundle branch block, changes in the ballistic pattern not associated with hypertension or a rigid aorta represent results of defects in *expulsive force of the ventricle* and must be due to lesions of appreciable extent. They do not lead to an etiologic diagnosis, for the scarring due to healed beriberi cannot be distinguished by its functional effects from that due to coronary disease, heart failure, or acute myocarditis. No one should be confined to bed or even to his home because of abnormal ballistocardiograms alone. Men have lived active lives for decades with grade 4 murmurs, complete heart block, auricular fibrillation, or bundle branch block, and they undoubtedly will do so with grade 4 ballistocardiograms. Yet insurance companies would profit by refusal to insure such cases routinely. Starr's experience suggests that the prognosis is worse for a man in apparent good health with grade 4 curves than for a similar patient with bundle branch block.[2]

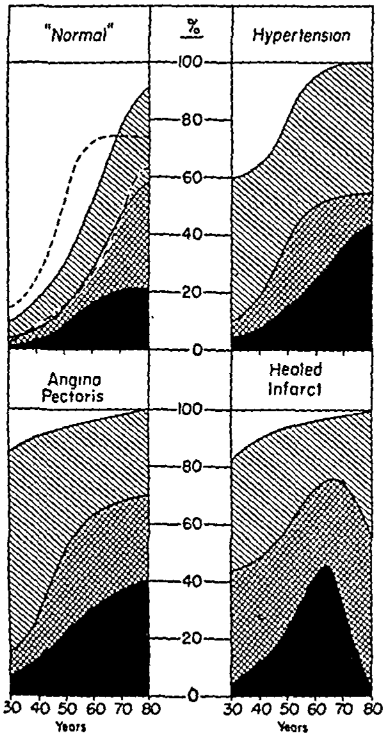

Fig. 3.—Diagrams illustrating the percentage distribution of normal and abnormal ballistocardiograms in control subjects and in groups of diseased patients of various ages. White areas represent normal traces at rest and after exercise; cross-hatched areas, definite abnormality as defined in text; double hatched area, marked abnormality; black area, maximal abnormality. The dashes show incidence of grade 3 coronary sclerosis at autopsy in men[9a]; dots and dashes, same for women.[9b]

The records may be classified according to the four grades of Brown, Hoffman, and de Lalla,[8] based on the tracing obtained during normal respiration or, as in the accompanying figures, the over-all findings can be grouped as definite, marked, or maximal deviations from normal, based on the responses to exercise and held respiration, as well as on the resting ballistocardiogram with normal breathing. "Maximal abnormality" includes the cases with totally abnormal complexes of low amplitude under basal conditions (Brown grade 4). "Marked abnormality" includes those which, at rest or after exercise, showed notched J waves or low amplitude irregular I-J waves, usually becoming unidentifiable in expiration (Brown grade 3). "Definite abnormality" includes those which, at rest or after exercise, show unusual respiratory variation, with good amplitude during inspiration (Brown grades 1 and 2). As with changes in apical chest shadows and ventricular complexes of the electrocardiogram, the normal proceeds into maximal evidence of disease by imperceptible steps, so that any group of examiners or even the same examiner on different days will not classify 100 tracings or films in exactly the same way. Classification is useful for statistical study and for individual examination of all tracings for individual cases.

RANGE OF VARIATION IN BALLISTOCARDIOGRAMS IN HEALTH AND DISEASE

Using the above criteria, we have constructed four diagrams (fig. 3) to show the effects of age on the type of tracings encountered in health, in uncomplicated hypertension, in angina pectoris, and after myocardial infarction. Starr's[2] statistics suggest that normals with abnormal tracings will manifest heart disease within the decade far more frequently than those with normal tracings. Dry and his co-workers[9] have shown an incidence of coronary sclerosis in our population that explains in part why increasingly frequent abnormalities in electrocardiograms and ballistocardiograms are to be expected in "normal" persons over the age of 50. The ballistocardiogram, which is slightly altered by aortic rigidity, by emphysema, or even by *flabby abdominal walls*, as well as myocardial scars, naturally has the higher frequency of abnormalities.

The normal group (fig. 3) consisted of 100 consecutive subjects in whom there was no reason to suspect heart disease after evaluation of history and complete clinical examination. Sixty-two per cent of these patients were over 50 years of age. Our statistics demonstrate that one should expect normal or only slightly abnormal ballistocardiograms in well over 90% of patients who are under 50 years of age and who are without evidence of heart disease. Of our 48 "normal" subjects in the sixth decade, 22% had ballistocardiograms that were decidedly abnormal; the ballistic abnormalities were often accentuated by the two step exercise test.

The group of 78 hypertensive patients (fig. 3) had been evaluated by electrocardiogram, ballistocardiogram, and funduscopy. None of these patients was in congestive heart failure, and none had any complaints suggestive of coronary insufficiency. The abnormalities found in the ballistocardiograms increased in direct proportion to the severity of the hypertensive cardiovascular disease. The change in cardiac ejection evident in advanced hypertension is probably the result of a damaged myocardium working against an increased peripheral resistance.

None of the 152 consecutive cases of classical angina pectoris (fig. 3) gave a clinical history of myocardial infarction, but 16% of the patients had electrocardiographic changes indicative of serious heart disease, and such electrocardiographic findings were always associated with definite ballistocardiographic abnormality. Since only 12 patients (8%) of this series had normal resting ballistocardiograms, and of these, only two remained normal after the performance of exercise, the diagnostically important association of ballistocardiographic abnormality with angina pectoris is evident. Twenty-eight per cent of this group had maximal ballistocardiographic abnormalities; in an additional 21%, grade 3 or 4 ballistocardiograms developed after effort. In only 8% of this group of 152 patients with angina pectoris did exercise result in an improvement of the ballistocardiogram to a relatively normal state. We noted a general correlation between the severity of the angina and the abnormality of the ballistocardiogram. In three of the patients, myocardial infarctions developed after these studies were made. The ballistocardiographic abnormalities in these particular cases were grade 3 or 4.

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[8] Brown, H. R., Jr.; Hoffman, M. J., and de Lalla, V., Jr.: Ballistocardiographic Findings in Patients with Symptoms of Angina Pectoris, Circulation 1: 132 (Jan.) 1950.

[9] (*a*) White, N. K.; Edwards, J. E., and Dry, T. J.: The Relationship of the Degree of Coronary Atherosclerosis with Age in Man, Circulation 1: 645 (April) 1950. (*b*) Ackerman, R. F.; Dry, T. J., and Edwards, J. E.: Relationship of Various Factors to the Degree of Coronary Atherosclerosis in Women, Circulation 1: 1345 (June) 1950.

Ninety-eight patients who had survived one or more attacks of myocardial infarction form the basis for another portion of figure 3. Seven per cent of the patients had normal resting ballistocardiograms; about half of these became abnormal after effort. Of this series, 40% had maximal abnormalities in the ballistocardiogram; an additional 18% showed grade 3 or grade 4 changes after the performance of exercise. None of the patients was in congestive heart failure when these studies were made. Most of the ballistocardiograms were taken at least a year after the occurrence of the myocardial infarction. Of the men under 60, a great proportion were working. A definite correlation was found between the severity of the angina more recently noted by the patient and the abnormality of the ballistocardiogram. All the patients incapacitated by angina had grade 3 or 4 ballistocardiograms. At least eight of the patients with no complaints of angina but with distinctly abnormal ballistocardiograms had their activity limited because of episodes of congestive heart failure; 12% of the patients in this series were fully digitalized. Since these studies were completed, three patients have died from another episode of proved coronary thrombosis. Two of these had ballistocardiographic abnormalities classified as grade 3; the other was described as grade 4. A comparison of the incidence of maximal abnormality in older patients with angina and with healed infarction also suggests that survival is short in the latter group.

Thirty-seven men and seventeen women were studied by electrocardiograph and ballistocardiograph because of complaints of epigastric or chest pain. Careful study revealed extracardiac causes and no evidence of heart disease. Usually it was because of the excellent ballistocardiographic records in these patients, all of whose electrocardiograms were normal, that we were led to search for a noncardiac explanation of the chest pain. All but six basal ballistocardiograms were normal; these six were grade 1. Four of these six subjects were in the seventh decade of life. After performance of the two step exercise test in four other subjects, the normal basal ballistocardiograms became grade 1. Of this group of 54 patients, 5% were in the seventh decade of life; 21% were in the sixth decade; 39% in the fifth decade; 28% in the fourth decade, and 7% were less than 30 years of age. Cholecystitis was the final diagnosis in 12%; radiculitis or scoliosis in 33%; hiatus hernia in 9%; gastric or duodenal ulcer in 19%, and neurocirculatory asthenia in 19%. It will be necessary to follow these cases, especially those with definite ballistocardiographic changes, to see how many also had latent coronary disease.

Four patients with normal ballistocardiograms had chest pain associated with smoking, and no other cause was found for pain. We do not regard these as proved cases of coronary disease. On the other hand, we have seen two men in their twenties whose ballistocardiograms and finger pulses were definitely reduced by smoking one cigarette; these subjects had no chest pain or hypertension and had only moderate tachycardia while smoking. While sensitivity to vascular effects of smoking may thus be detected by the ballistocardiograph, it is apparent that not all those who get precordial discomfort from smoking will show changes in ballistocardiograms taken while smoking.

The following case histories illustrate the practical value of these studies in the evaluation of cardiovascular functions of various types of patients.

REPORT OF CASES

Case 1 (Chest Pain Not Due to Cardiovascular Disease).—Mrs. A. S., 55, suffered from pain in the left chest and the left shoulder. The pain began as she commenced her morning chores. It was aggravated by all physical effort; it was not related to food. Relief followed when she lay down; sleep was undisturbed. The blood pressure was 165/100 mm. Hg. Heart and lungs were normal. The history was suggestive of angina pectoris, but normal electrocardiograms and ballistocardiograms (fig. 2A) led us to seek another cause. Roentgenograms showed scoliosis of the cervical and thoracic spine, and orthopedic care resulted in complete relief of symptoms.

Case 2 (Hypertension Without Cardiovascular Symptoms).—Mr. A. I., 38, suffered from headaches but had no symptoms suggestive of cardiovascular insufficiency. His blood pressure was 195/110 mm. Hg. The eye grounds showed no hemorrhages or exudates. The heart was of normal size on roentgen study, but the configuration suggested left ventricular hypertrophy. The electrocardiogram was normal; the ballistocardiogram (fig. 4A) showed normal waves under basal conditions. After performance of the two step exercise test, the shortening of the I-J in comparison to the J-K and an increased respiratory variation followed. This ballistocardiogram was graded 2.[10]

Case 3 (Angina Pectoris).—Mr. I. M., 48, had been treated for peptic ulcer for 10 years and for 10 months had had precordial pain on walking. His blood pressure, renal function, and electrocardiograms, even after two step exercise, were normal. Glucose tolerance curves were normal; the blood cholesterol was only 224 mg. per 100 cc. The heart was normal on roentgen study. Ballistocardiograms were grade 1 under basal conditions, with smaller excursions and grade 2 respiratory variation after the two step test.

Case 4 (Healed Myocardial Infarction).—Mr. H. S., 63, had been kept in bed for nine weeks in 1947 because of myocardial infarction. He was not diabetic or hypertensive. His activity is now limited by angina of effort. The heart shadow was not remarkable, but the electrocardiograms showed a constant change compatible with healed anterior wall infarction. The ballistocardiogram (fig. 4B) was grade 3 under basal conditions, grade 4 after exercise, which evoked no pain or change in the electrocardiogram. The ballistocardiogram looked almost normal during abdominal compression with the breath held in expiration. On the basis of these findings and Brown's report on the value of abdominal binders for such patients,[11] such a support was prescribed. There has been a striking, but not complete, relief of symptoms.

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[10] Makinson, D. H.: Changes in the Ballistocardiogram After Exercise in Normal and Abnormal Subjects, Circulation 2: 186 (Aug.) 1950.

CASE 5 (Acute Rheumatic Carditis).—Mr. M. L., 34, was seen in March, 1950, because of fatigability, weakness, aching "muscles," and loss of appetite. This illness had begun four weeks previously, with four days of fever, muscle pain, and arthralgia involving the knees, ankles, and wrists. The patient had then been given daily injections of penicillin, and after 10 days at home he returned to work. There was no past history suggestive of rheumatic fever. On examination, the patient did not appear ill; his temperature was normal; pulse was 96 per minute and regular, and the blood pressure was 130/80 mm. Hg. The apical heart beat was at the fifth intercostal space in the midclavicular line. The rhythm was regular, and the heart sounds were of good quality. A soft apical systolic murmur was noted. The lungs were clear. Examination of the abdomen revealed no palpable masses or organs. There was no articular swelling or tenderness. The laboratory studies showed hemoglobin 14.1 gm.; white blood cells, 9,750, with a slight polynucleosis. Urinalysis was normal. The sedimentation rate (Westergren) was 85 mm. in one hour. The electrocardiogram was normal on March 8, 1950. Figure 5A represents ballistocardiograms taken under basal conditions, the upper tracing having been taken on March 8, and the lower tracing on March 15. They showed tall L and H waves and a slurred J-K of low amplitude. He was kept in bed for several weeks until his sedimentation rate returned to normal. Electrocardiograms showed prolongation of the P-R interval during the second week, which persisted until the sixth week. The electrocardiogram taken at the eighth week was normal, and the ballistocardiogram (fig. 5B) was normal under basal conditions and after performance of the two step exercise test.

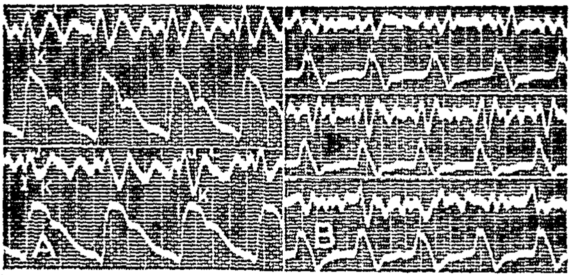

Fig. 4.—*A*, record from a hypertensive patient, 38, without cardiac symptoms (case 2). The upper record taken at rest is within normal limits, but the lower one registered after exercise shows pronounced respiratory variation and short J waves. *B*, record from a man, 63, two years after a myocardial infarction (case 4). Upper record taken in basal state is classified grade 3; middle taken with breath held in expiration shows better complexes; lower record taken after exercise is grade 4.

SUMMARY

A simple method of recording the ballistocardiogram is described, together with some case histories illustrating the value of the records in the study of various types of heart disease. The interpretation of the curves is discussed, and the incidence of various degrees of abnormality in different age groups and with certain common forms of cardiovascular disease is presented. The ballistocardiograph adds to our understanding of the vascular state of patients and is a sensitive indicator of vascular aging. If the heart muscle is sound, the tracings may be normal after myocardial infarction or in the presence of angina; if diastolic pressure is low or stroke volume large, the tracings may be normal in the presence of myocardial failure. Yet a patient with angina or with a silent healed infarct frequently has an abnormal ballistocardiogram as the only objective evidence of heart disease.

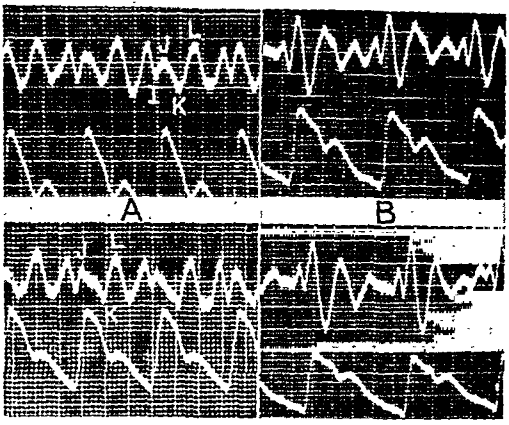

Fig. 5.—*A*, record from a man, 34, with rheumatic arthritis (case 5). At time of upper tracing, P-R interval was 0.16 sec. One week later, at time of lower tracing, it was 0.22 sec. The low J, tall L, and tall presystolic H are frequently seen in heart failure with gallop rhythm, but this man had only a soft systolic murmur. *B*, normal tracings on same man two months later with no clinical evidence of rheumatic activity Upper record was taken in basal state, lower one after exercise.

[11] Brown, H. R., Jr.; Hoffman, M. J.; Epstein, M. A., and de Lalla, V., Jr.: The Use of Abdominal Supports in Patients with Angina Pectoris as Selected by the Ballistocardiogram, J. Clin. Investigation 29: 799 (June) 1950.

PROLAPSE OF THE URETHRA IN YOUNG GIRLS

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and
Rafe Banks Jr., M.D., Atlanta

Prolapse of the urethra in young girls has not been found very frequently in the past, and information on the diagnosis and management of this condition appears to be somewhat varied.[1] During the past six months four such patients have come under our care at Grady Memorial Hospital. Their condition previously had been undiagnosed and incorrectly treated. From these patients we have learned certain facts about the diagnosis and management of prolapse of the urethra which we feel to be of practical value. We present these cases to emphasize the occurrence of this condition in young girls and to offer a simple and effective form of treatment.

In 1937 Epsteen and Strauss [2] analyzed the literature and stated that the condition had been reported in 111 young girls. Keefe [3] has stated that 60% of cases occur in girls under the age of puberty.

From the Department of Urology, Grady Memorial Hospital, and Emory University School of Medicine.

1. Berry, N. E., and Greene, H. H.: Prolapse of the Female Urethra, J. Urol. 39: 92, 1938.
2. Epsteen, A., and Strauss, B.: Prolapse of the Female Urethra with Gangrene, Am. J. Surg. 35: 563, 1937.
3. Keefe, J. W.: Prolapse of the Female Urethra, J. A. M. A. 69: 1935 (Dec. 17) 1917.

ETIOLOGY

Many different theories have been offered to explain the etiology of this condition, but none are conclusive. It has been attributed to redundancy of the mucosa, to a neuromuscular dysfunction, to laxness of the tissues supporting the mucosa, and, finally, to stresses incident to coughing and straining. We have found no etiological factor in our cases.

CLINICAL FINDINGS

The principal clinical findings have been urethral bleeding, varying degrees of dysuria, and a mass presenting at the urethral meatus. The bleeding was noted as a "spotting" on the child's underclothes, and this directed the mother's attention to the mass. Pain on urination has varied from none to severe. The mass presenting at the urethral meatus may have an inflamed and edematous appearance, or, if the prolapse has been of sufficient duration, it may be ecchymotic.

Catheterized urine specimens, cystoscopy findings, and intravenous urograms were normal. The prolapse of the urethral mucosa involved the entire circumference of the lumen of the urethra in all cases. In no case was there any vaginal discharge.

DIAGNOSIS

The diagnosis of this condition offers no particular problem if one remembers that the prolapse involves the entire circumference of the meatus. When a mass is found anterior to the vaginal orifice, the correct relationship of the urethral canal to the mass must be ascertained. In a true prolapse the lumen is always directly in the center. Occasionally this condition must be differentiated from urethral polyp, caruncle, condyloma, urethrocele, and carcinoma. In urethral polyps the polyp is in the center of the lumen, and the mucosa is around it. In caruncle the lesion is usually found only on the posterior lip of the meatus and is very sensitive to touch. Condyloma has a warty, fungoid appearance and is usually multiple. Urethrocele is a herniation through the urethrovaginal septum and not through the urethral meatus itself. Carcinoma may be difficult to differentiate, and biopsy is occasionally necessary for diagnosis. The average age for carcinoma of the urethra is 53. It is extremely rare in young girls.

TREATMENT

There have been many operations devised and used to alleviate this condition. Some authorities have advocated only simple digital replacement. Gangrenous mucosal tissue precludes this procedure. Inserting a catheter into the bladder and then tying a ligature around it and the prolapsed mucosa, so as to allow the mucosa to slough off, has been done in the past. Livermore [4] has had success with his four-point fulguration, as has Hepburn [5] with his suprapubic approach. Sharp amputation of the prolapsed cuff, suturing together the severed end, and amputation with a cautery loop without suturing have been used with apparent success by various advocates.

Our routine of treatment has consisted of preoperative hot sitz baths until a line of demarcation has been established between normal urethral mucosa and the inflamed prolapsed mucosa. This is followed by a complete circular excision of the prolapsed mucosal cuff with the cautery loop along this line of demarcation, so that the entire prolapsed portion is removed. This excised portion is a 360 degree cuff of tissue with a definite lumen. We do not feel that approximating the cut edges of the meatal mucous membrane is indicated or necessary. The cautery loop provides adequate hemostasis. Should postoperative bleeding occur, it is controlled easily by an indwelling catheter for 24 to 48 hr.

The postoperative courses of these four young girls were certainly gratifying. They had very little discomfort even during the first few days and were completely symptom-free in 10 days. In all cases the appearance of the urethral meatus was normal, and we were able to pass 16 F. catheters with ease within 10 days following the procedure. To date, two to six months postoperatively, no strictures have occurred, and there has been no difficulty in urination.

REPORT OF CASES

Case 1.—N. S., a 5-year-old Negro girl, was admitted on Aug. 30, 1949, with dysuria of 10 months' duration, which was getting progressively worse. Her family had observed a "swelling" in her vulva, and spots of blood on her underclothes had been seen. Elsewhere the lesion had been treated with applications of silver nitrate without satisfactory results. Her past history was noncontributory as far as her present difficulty was concerned. A physical examination at birth had been recorded as showing no abnormality. At the time of admission a definite outpouching of the urethra was observed. It measured about 1.5 cm. in diameter and protruded about 0.75 cm. The lesion was inflamed, with areas of gangrene. In the center of this protruding mass the urethral orifice could be seen. A catheter was passed easily, and the urine from the bladder was found to be microscopically normal. Cystoscopic findings and an intravenous urogram were also normal. The lesion improved in appearance after hot sitz baths, and three days later the lesion was excised throughout its entire circumference with the cautery loop. In one week the patient was asymptomatic, and the urethral meatus appeared normal. When last seen, about six months after the procedure, the patient appeared normal, and no stricture was observed.

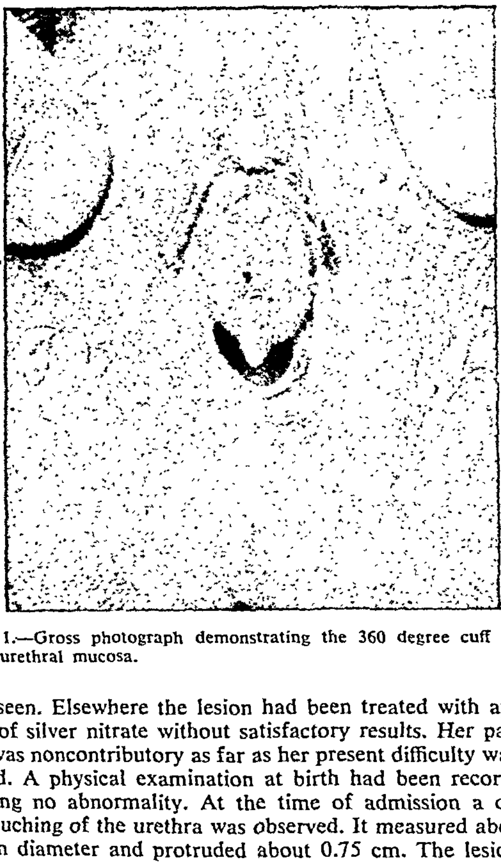

Fig. 1.—Gross photograph demonstrating the 360 degree cuff of prolapsed urethral mucosa.

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[4] Livermore, G. R.: The Treatment of Prolapse of the Urethra, Surg., Gynec. & Obst. 32: 557, 1921; Non-Operative Treatment for Prolapse of the Urethra, J. Urol. 25: 99, 1931.

[5] Hepburn, T. N.: Prolapse of the Female Urethra, Surg., Gynec. & Obst. 31: 83, 1920; Prolapse of the Urethra in Female Children, ibid. 44: 400, 1927.

Case 2.—J. S., a 5-year-old Negro girl, was admitted on Aug. 27, 1949, with the complaint voiced by her parents that she had a "swelling in her privates." According to her mother, this had started five days previously. The girl also had moderate pain on urination, and bleeding was observed at the urethral meatus. No previous treatment had been sought. She had been born at this hospital, and a routine examination at birth had disclosed no abnormalities. On examination it was noticed that the region of the urethral meatus was edematous, protruding, and inflamed. A catheter was passed easily through the center of this protruding mass, and the bladder urine was found to be normal. Again, cystoscopy findings and an intravenous urogram were normal. After hot sitz bath treatments the redundant tissue was excised without incident. This patient had dysuria for three weeks, but after that she was asymptomatic and the meatus had a normal appearance. When last seen, four months following the procedure, there was no evidence of a stricture.

Case 3.—E. T., a 7-year-old Negro girl, was admitted with the complaint of "bleeding from the privates" for five days. No previous trouble had been observed. The mother had noticed three days prior to admission an inflamed protruding mass in the child's vulva. Virtually no urinary symptoms had occurred. Examination revealed an inflamed protruding mass at the urethral meatus. Any manipulation of the lesion would cause bleeding. The urethral orifice was easily seen in the center of this mass, and a catheter was passed. The bladder urine was microscopically normal. No abnormality was revealed by cystoscopy or on the urogram. Excision of the prolapsed mass was done on the fourth day with minimal bleeding. After this the patient was clinically asymptomatic, and within 10 days the urethral meatus had an entirely normal appearance. At the last visit, six weeks later, the child had no symptoms and no evidence of stricture.

Case 4.—C. D., a 3-year-old Negro girl, was brought into the hospital because her parents had noticed "spots of blood" on her underclothes. This had been present for three days. The day prior to admission a physician had been consulted, and he made a diagnosis of an edematous and hemorrhagic hymen. No urinary symptoms were present. Examination revealed an inflamed and hemorrhagic mass protruding from the urethral meatus. Several small areas were gangrenous. The urethral orifice was identified easily. The bladder urine was microscopically normal, and cystoscopy findings and intravenous urograms were normal. Hot sitz baths were prescribed, and on the fourth day excision of the prolapsed urethra was done. There were no postoperative urinary symptoms, and the patient was discharged on the fourth postoperative day. When she was seen as an outpatient one week later, the meatus appeared entirely normal. At the last visit, about four weeks later, no stricture was observed.

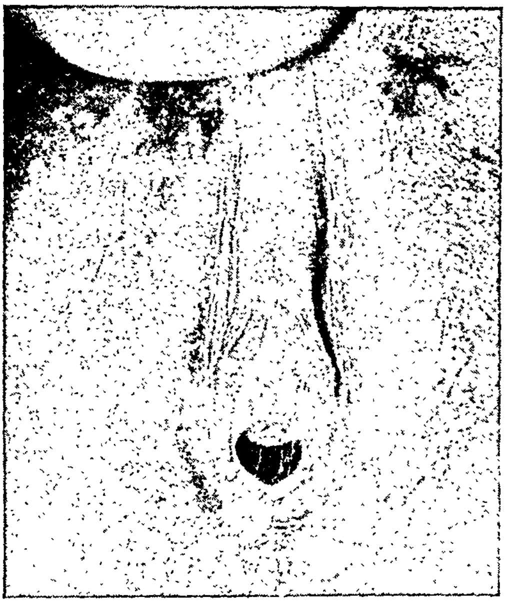

Fig. 2.—Urethral orifice six days postoperatively.

PATHOLOGY

There are no pathognomonic findings in the microscopic appearance of the tissue.[6] It is a picture of vascular engorgement with acute and chronic inflammation of the urethral mucosa and the underlying tissues. In many areas the vascular engorgement is extreme. The numerous telangiectatic spaces are similar to those seen in internal hemorrhoids. This fact is not surprising, for the same stress factors are present in the two conditions. A frequent pattern of small vascular channels lying vertical to the surface is also present. This is similar to many superficial granulomatous processes.

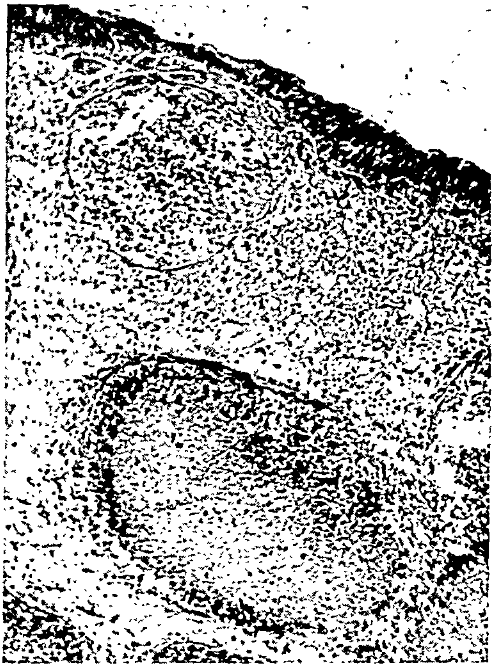

Fig. 3.—Photomicrograph showing the greatly dilated vessels and marked congestion and inflammation of the prolapsed urethra. × 120.

If it is assumed that the pouching-out of the mucosa was the primary change, all the vascular changes observed in our cases could well have been secondary to stress, interference with blood supply and return, and the infection of the prolapsed tissue.

SUMMARY AND CONCLUSIONS

Four cases of prolapse of the urethra in young girls are reported. Emphasis is placed on diagnosis and what we believe is an efficient method of treatment. Prolapse of the urethra in young girls, although heretofore not thought very common, is certainly not a rarity and seems more prevalent at an early age. Typical findings are bleeding from the lesion, a "mass" presenting at the urethral orifice, and varying degrees of dysuria. In our cases the prolapse occurred for the entire circumference of the urethral mucosa. Adequate treatment consists in total excision of the prolapsed portion. An indwelling urethral catheter may be used in cases of excessive bleeding. Sutures were not found necessary. The patients became asymptomatic early, and stricture formation has not been observed.

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[6] The microscopic slides were reviewed by Dr. A. G. Foraker of the Department of Pathology, Emory University School of Medicine.

CLINICAL ASPECTS OF CORONARY HEART DISEASE

AN ANALYSIS OF 100 CASES IN PATIENTS 23 TO 40 YEARS OF AGE WITH MYOCARDIAL INFARCTION

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H. B. Sprague, M.D., Brookline, Mass.
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In an attempt to solve some of the problems of coronary heart disease in young men and women, thereby gaining a better understanding of the disease as it occurs in older patients, a special project was established at the Massachusetts General Hospital, Boston, in 1946. Since then, 100 patients who had myocardial infarction prior to the age of 40 have been studied. In addition, 146 persons (average age 38), healthy at the time of the examination, were studied for purposes of comparison. This report is confined to the clinical aspects of coronary heart disease in the former group.

For many years it has been recognized that atherosclerotic changes in the coronary arteries are not concomitant with "old age" alone, and that such changes can be, and often are, found in young men and women in whom none of the other expected changes of old age can be demonstrated. Indeed, case reports of angina pectoris and myocardial infarction in persons less than 40 years of age have appeared in the medical literature with increasing frequency since Herrick's original report in 1912 of the clinical pictures of myocardial infarction correlated with the pathological changes of the coronary vessels in this condition.[1] But it is only recently that interest has centered in the younger age groups, and several excellent and detailed studies have been published.[2] Coronary heart disease has been reported in infancy [3] and as early as five years of age in cases of progeria.[4]

When the project was established it was decided that emphasis should be placed on the etiology of the disease as it related to familial tendency, biochemical and metabolic changes, body build, previous medical history, and physical findings. Furthermore, and in order to avoid coloring the results with the changes found in older people, it was decided that the patients to be studied must have experienced myocardial infarction prior to the age of 40, with an unequivocal clinical history and electrocardiographic evidence of such myocardial infarction; they must have been less than 50 years old when examined, and they must have experienced the last episode at least six months before the examination. In addition, the selected patients were to have "pure" myocardial infarction, uncomplicated by hypertension, peripheral vascular diseases, diseases of the collagen group, diabetes, xanthomatosis, or other recognized metabolic disorders.

The names of the first patients selected for evaluation were taken from the files of the Massachusetts General Hospital and from the records of cardiologists in the Boston area who were interested in this work. Later, in order to obtain a better cross section of the entire population, hospitals and cardiologists throughout the country were requested to submit the names of patients who met the requirements and who were willing to come to Boston for examination. Their splendid response is shown by the fact that 59 patients from all parts of the country east of the Rocky Mountains were examined.

During the examination the patients were admitted to the Massachusetts General Hospital for periods of approximately 24 hr., and the following studies were completed: history and physical examination, anthropometric measurements, biochemical determinations, and hormonal appraisal.

This paper is concerned principally with the clinical aspects of the patients studied, including the fluoroscopic and X-ray findings, electrocardiographic changes, physical examination, and that part of the medical history related to the preceding symptoms and those described by the patient at the time of the acute episode.

CLINICAL OBSERVATIONS

Sex.—A total of 100 persons (97 men and three women) were examined. The ratio of men to women in this series is essentially the same as that previously reported by Glendy, Levine, and White, i. e., 24:1.[5]

Age of Onset.—The average age of the 97 men at the time of the acute episode was 35.4 yr., of the three women 38 yr. The over-all span was 24 to 51 yr. The youngest patient examined was a 24-year-old intern who had experienced the episode one year previously.

From the Coronary Research Project, Cardiac Department, Massachusetts General Hospital and Harvard Medical School, Boston. Supported by a grant from the Commonwealth Fund, New York.

Clinical Fellow in Medicine, Massachusetts General Hospital (Dr. Gertler); Physician in Charge, Cardiac Clinics and Laboratory, Massachusetts General Hospital (Dr. Bland); Research Fellow, Forsythe Dental Infirmary, Boston (Dr. Garn); Clinical Associate in Medicine, Harvard Medical School, and Associate Physician, Massachusetts General Hospital (Dr. Lerman); Clinical Professor of Medicine, Harvard Medical School, and Physician, Peter Bent Brigham Hospital (Dr. Levine); President, American Heart Association, Chief of Staff, House of the Good Samaritan, and Associate Physician, Massachusetts General Hospital (Dr. Sprague), and Executive Director, National Advisory Heart Council, Clinical Professor of Medicine, Harvard Medical School, Chief Consultant National Heart Institute, and Consultant, Masachusetts General Hospital (Dr. White).

1. Herrick, J. B.: Clinical Features of Sudden Obstruction of the Coronary Arteries, J. A. M. A. **59**: 2015-2020 (Dec. 7) 1912.

2. (*a*) Yater, W. M.; Traum, A. H.; Brown, W. G.; Fitzgerald, R. P.; Geisler, M. A., and Wilcox, B. B.: Coronary Artery Disease in Men 18 to 39 Years of Age: Report of 866 Cases, 450 with Necropsy Examinations, Am. Heart J. **36**: 334-372, 481-526, and 683-722, 1948. (*b*) Glendy, R. E.; Levine, S. A., and White, P. D.: Coronary Disease in Youth: Comparison of 100 Patients Under 40 with 300 Persons Past 80, J. A. M. A. **109**: 1775-1781 (Nov. 27) 1937.

3. Minkowski, W. L.: Coronary Arteries of Infants, Am. J. M. Sc. **214**: 623-629, 1947.

4. Talbot, N. B.; Butler, A. M.; Pratt, E. L.; MacLachlan, E. A., and Tannheimer, J.: Progeria: Clinical, Metabolic and Pathologic Studies on a Patient, Am. J. Dis. Child. **69**: 267-279 (May) 1945.

5. White, P. D.: Heart Disease, ed. 3, New York, The Macmillan Company, 1944, p. 28.

Ethnic and Racial Origin.—The racial and ethnic groups common on the east coast were all represented in this series. The largest group (32) was of Scotch-English and Scotch-English-Irish origin; an additional 12 were second or third generation Irish; two were Negroes.

Of the series, 27 were Jewish, six were Italian, two were French, one was Armenian, and one was Syrian. Thus, persons of Mediterranean or east Mediterranean origin comprised 37% of the group—a proportion well in excess of their representation in the areas from which the sample was drawn.

Occupation.—As concluded in reports of a similar nature, occupation does not seem to be causally related to the development of coronary heart disease.[6] Nevertheless, the present series reveals an overloading of certain occupational categories: the managerial (38%), executive (11%), professional (14%), and skilled-labor positions (37%) comprise a disproportionate section even among patients referred by the Veterans Administration. Thus, in this series, as in others, certain types of occupation do predominate.[7]

Of the group, 29 changed their occupations in order to avoid heavy labor, lifting, excessive walking, and the like. One, an enlisted man at the time of attack, has regressed to a life of complete inactivity, which includes 12 hr. of sleep per day. Six of the 29 have no regular activity but work sporadically at odd jobs and part-time employment.

TABLE 1.—*Age and Sex Distribution*

Age at Onset	Men	Women	Total
20-29	8	0	8
30-34	28	0	28
35-40	61	3	64

TABLE 2.—*Daily Tobacco Intake of the Coronary Disease Group and the Control Group*

	Cigarettes	Cigars	Pipes*
Coronary group	19.4 ± 1.6†	0.17 ± 0.10	0.85 ± 0.29
Control group	13.8 ± 1.1	0.25 ± 0.09	0.56 ± 0.16

* Each pipeful was considered to be 0.1 oz.
† Mean ± standard error.

It appears likely that this is an occupational expression of mesomorphy, and hence there may be no definite causal relationship between occupation and coronary heart disease.[8]

Tobacco and Alcohol.—Data relating to the weekly alcohol intake and the daily tobacco intake of both the coronary disease group (prior to the episode) and the control group are summarized in tables 2 and 3.

On the average, the coronary disease group consumed more tobacco than the control group. The total cigarette intake of the coronary disease group was significantly greater ($p = 0.02$) than that of the control group.

In absolute quantities, the control group consumed more alcoholic beverages than the coronary disease group. However, the coronary disease group ingested significantly more alcohol in the form of scotch, gin, and bourbon ($p = 0.05$) than did the control group.

TABLE 3.—*Weekly Alcohol Consumption of the Coronary Disease Group and the Control Group*

	Beer	Wine	Liquor
Coronary group	*25 ± 4.87**	*2.9 ± 1.14*	*6.4 ± 1.27*
Control group	32 ± 5.08	2.5 ± 0.56	3.6 ± 0.69

* Mean ± standard error.

Data referring to the number of persons in each group who (*a*) refrained from ingesting alcohol and smoking and (*b*) ingested alcohol and smoked are summarized in tables 4 and 5.

Not only did the smokers in the coronary disease group smoke more than did the smokers in the control group, but there were proportionately more persons in the coronary disease group who smoked. There was no difference in the proportion of persons in both groups who ingested alcohol.

These data do not give any information on the effect that smoking may have on the cardiovascular system, as has been provided by several authors.[9] It should not be inferred from these results that cessation of smoking will benefit or prevent coronary heart disease.

Incidence by Month, Season, and Time of Day.—There is a greater absolute incidence of myocardial infarction in the fall and winter months, which, on statistical analysis, is significant ($p = 0.01$). Thirty episodes occurred in the fall, 31 in the winter, 19 in the spring, and 20 in the summer. The majority of attacks listed for fall or spring occurred during the late fall or early spring months, which again demonstrated the proclivity of infarctions to occur during cool or cold weather. Of those that occurred during the summer months, 11 of the 20 were directly related to heavy work or exercise, such as playing tennis.

TABLE 4.—*Smokers and Nonsmokers in the Coronary Disease Group and the Control Group*

	Smokers	Nonsmokers
Coronary group	81	9
Control group	107	32

Chi square = 8.94 (significant $p > 0.01$)

The majority of episodes occurred during the hours of increased activity after meals, with the greatest incidence in the midafternoon. On the average, the episodes occurred shortly after the midday meal. The majority of acute episodes (62%) occurred between the time of waking and shortly after the noon meal, the time of day during which most men are active.

Preceding Complaints.—Each patient said he had one or more symptoms; thus the symptom of angina pectoris was elicited in 41 instances, dyspnea in 22, indigestion in 20, fatigue in seven, and nervousness in four. In 15 in-

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6. Master, A. M.; Dack, S., and Jaffe, H. L.: The Relation of Effort and Trauma to Acute Coronary Occlusion, Indust. Med. **9**: 359-364, 1940. Levy, R. L., in discussion on Master, Dack, and Jaffe.

7. Boas, E. P., and Donner, S.: Coronary Artery Disease in Working Classes, J. A. M. A. **98**: 2186-2189 (June 18) 1932. Levine, S. A.: Clinical Heart Disease, ed. 3, Philadelphia, W. B. Saunders Company, 1945, p. 14.

8. Woods, W. L.; Brouha, L., and Seltzer, C. C.: Selection of Officer Candidates, Cambridge, Mass., Harvard University Press, 1943, p. 12. Seltzer, C. C., and Brouha, L.: The "Masculine" Component and Physical Fitness, Am. J. Phys. Anthropol. **1**: 95-108, 1943.

9. (*a*) Levy, R. L.; Mathers, J. A. L.; Mueller, A. A., and Nickerson, J. L.: Effects of Smoking Cigarets on the Heart in Normal Persons and in Cardiac Patients, J. A. M. A. **135**: 417-422 (Oct. 18) 1947. (*b*) Evans, W. F., and Stewart, H. J.: The Effect of Smoking Cigarettes on the Peripheral Blood Flow, Am. Heart J. **26**: 78-91, 1943. (*c*) English, J. P.; Willius, F. A., and Berkson, J.: Tobacco and Coronary Disease, J. A. M. A. **115**: 1327-1329 (Oct. 19) 1940.

stances precordial pain was associated with radiation of pain—to one or both arms in 14 instances and to the left shoulder in one instance. Of the 64 patients who gave a history of complaints prior to the incident (angina, substernal oppression, and the like), eight said that the complaints had been present longer than one year, three had them as long as four years, and one as long as five years. The 52 remaining patients had noted some form of distress (presumably other than cardiac) less than one year, usually only a few months, preceding the attack. Three had had tightness in the chest on exertion only three days before the acute attack, which may represent a partial occlusion of one of the coronary vessels, progressing to complete occlusion and infarction on continued activity.

TABLE 5.—*Alcohol Intake in the Coronary Disease Group and the Control Group*

	Consumers	Abstainers
Coronary group	69	23
Control group	111	29

Chi square = 1.06 (not significant $p > 0.05$)

TABLE 6.—*Complaints at Onset on Myocardial Infarction*

Substernal and/or precordial pain	96	Dizziness	5
Nausea	15	Weakness	2
Indigestion	14	Cyanosis	2
Dyspnea	10	Headache	1
Vomiting	8	Palpitation	1
Excessive sweating	8	Choking	1
Collapse	7	Faintness	1

Complaints at Onset of Myocardial Infarction.—Only four of the 100 patients had no pain during the attack, but those four had other complaints, such as dizziness, nausea, and vomiting. The pain, when experienced, lasted seven hours for the group (with a range of 20 min. to 72 hr.). The pain was severe in 62 instances, moderate in 32 instances, and slight in four instances. The findings are summarized in table 6.

TABLE 7.—*Location of Radiated Pain During Episode of Infarction*

Both arms	29	Upper abdomen	4
Left arm	17	Mandible and teeth	3
Left wrist and hand	11	Right shoulder	2
Left hand and fingers	9	Throat	2
Middle of back	6	Both clavicles	1
Left shoulder	5	Right arm only	1
Left elbow	4	Left ear	1
No radiation of pain from substernal region			32

TABLE 8.—*Activity at Onset of Myocardial Infarction*

Resting	22	Climbing steps	4
Walking	21	Driving or riding	3
Manual labor	18	Getting out of bed	3
Sleeping	11	Eating	2
Performance of professional duties	8	Running	1
Exercising	6	Dressing	1

In 64 instances the pain was not confined to the precordium but radiated elsewhere to one or more regions. This is summarized in table 7.

Activity at Onset.—Of the 18 patients listed as having the episode while performing manual labor, nine experienced it while engaged in some type of work to which they were not accustomed. In two of these instances (see No. 12 and No. 83, Table 9) unusual excitement superimposed on the unusual activity at the time probably was an additional factor. A total of 21 persons engaged in some type of activity, exercise or otherwise, that required greater work on the part of the heart than did their usual daily routine. It is thought that this may be a factor in the development of infarction of the myocardium.

Additional information was provided on the question of the relationship of effort to coronary heart disease. From approximately 7:30 a. m. to 7 p. m. the observed episode rate was five and one-half per hour; for the remaining period of the day, which may be considered a period of "inactivity or basal rate," the rate of occurrence was two and four-fifths episodes per hour. Accordingly, one-half as many episodes are apt to occur during periods of rest or "inactivity" as during periods of activity. These points will be reconsidered at the conclusion of this paper.

Fluoroscopic and X-ray Findings.—Ninety-seven of the patients (the men) had roentgenographic examinations; these men were examined with the fluoroscope, and 7 ft. x-rays were made of the posteroanterior view. Two patients had left ventricular aneurysm with paradoxical pulsations. In one of these the infarction had occurred nine years previously, and in the other it had occurred one year before. Ten patients presented fluoroscopic evidence of diminished pulsation along the lateral margin of the left ventricle, which the roentgenologist interpreted as a probable area of infarction with scarring. These findings are much lower than those reported by other authors.[10]

TABLE 9.—*Episodes Occurring During Unaccustomed Activity*

Case No.	Age	Activity	Usual Occupation
2	40	Playing baseball after eating	Lawyer
12	34	Pulling hose to scene of fire	Gas station attendant
18	40	Running for train	Investment counselor
33	36	Walking in deep snow	Machinist
34	35	Shoveling coal	Housewife
39	38	Lifting heavy machinery	Lawyer
43	37	Mopping floors	Headwaiter
56	40	Walking uphill	Chemist
60	34	Playing touch football	Salesman
61	40	Walking uphill	Manager of store
65	27	Carrying heavy suitcase one-half mile	Aviator
71	31	Playing ball	Soldier
72	34	Digging in garden	Clerk
75	31	Lifting heavy machinery	Electrician (aircraft)
79	33	*Playing tennis*	Contractor
83	34	Digging foxhole under fire	Soldier
94	35	Mowing lawn	Insurance manager
8	29	*Dancing*	Soldier
25	25	Walking rapidly up several flights of stairs	Army officer
40	33	Marching uphill	Soldier (formerly hotel manager)
57	35	*Bowling*	Cook

Electrocardiographic Observations.—Using the three standard limb leads, three unipolar limb leads (aV_R, aV_L, aV_F), and six unipolar precordial leads (V_1 through V_6), evidence of infarction was demonstrated in every case, including one of 10 years' duration and another of 21 years' duration. There was a total of

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[10] Dack, S.; Sussman, M. L., and Master, A. M.: Roentgenkymogram in Myocardial Infarction: Clinical and Electrocardiographic Correlation, Am. Heart J. **19**: 464-474, 1940. Garland, L. H., and Thomas, S. F.: Roentgen Diagnosis of Myocardial Infarction, J. A. M. A. **137**: 762-769 (June 26) 1948.

(*a*) 54 anterior or anteroapical infarctions, as evidenced by QRS, S-T, and T wave changes in standard limb leads 1 and/or 2, a V_L, and the precordial leads, and (*b*) 40 posterior or posterolateral infarctions, as shown by alterations of QRS, S-T, and T waves in standard limb leads 2 and/or 3 and aV_F. The septum was involved to some extent in the majority of patients examined. Six patients presented the electrocardiographic picture of both anterior and posterior infarction. The results are summarized in table 10.

TABLE 10.—*Electrocardiographic Findings*

Rhythm	
Sinus tachycardia	3
Sinus bradycardia	3
Normal sinus rhythm	94
Conduction defects	9
Right bundle-branch block	3
Left bundle-branch block	2
Impaired intraventricular conduction (but not complete bundle-branch block)	2
AV block—	
Partial	2
Complete	0
No conduction defects	91
Axis deviation	
Left ventricular hypertrophy	11
Left axis deviation (— 30)	14
Right axis deviation	3

Biochemical Observations.—These observations are considered in other publications in greater detail.[11] The levels of serum cholesterol (free, esters, and total), uric acid, and phospholipids are listed in table 11. It is to be noted that the mean value of each variable in the coronary disease group exceeds the mean value of each variable in the control group. The mean serum lipid values and serum uric acid values of both groups are shown in table 11.

TABLE 11.—*Mean Values of Serum Lipids and Serum Uric Acid in the Coronary Disease Group and the Control Group*

	Coronary Group	Control Group
Free cholesterol	110.4 ± 3.9	99.7 ± 2.3
Esterified cholesterol	176.7 ± 5.5	121.7 ± 2.6
Total cholesterol	286.5 ± 6.6	224.4 ± 3.5
Phospholipids	316.4 ± 6.7	299.3 ± 3.3
Uric acid	5.13 ± 0.11	4.64 ± 0.06

TABLE 12.—*Physical Groupings in the Control Group and the Coronary Disease Group*

	Control Group, %	Coronary Disease Group, %
Endomorphy	29	26
Mesomorphy	19	42
Ectomorphy	22	7
Others	30	25

Body Build.—The coronary disease group was predominantly mesomorphic (muscular) and contained very few ectomorphic (linear) persons. These observations are given in detail elsewhere,[12] but the results are summarized in table 12 for the 97 men patients with coronary heart disease and for the 146 controls.

The difference in height and weight between the control group and the coronary disease group is discussed in greater detail in a separate publication.[13] It is sufficient to say here that the coronary disease group was 5 cm. shorter than the control group; the average height for the coronary group was 171 cm., and the average height for the control group was 186 cm. The average weight for the coronary group was 177 lb. (80,300 gm.), while the average weight for the control group was 171 lb. (77,500 gm.).

Physical Examination.—In the majority of cases the physical examination was remarkably unrevealing. This is consonant with other published data.[2a]

Hospitalization.—Seventy of the patients were hospitalized for an average of six and one-fifth weeks at the time of the acute episode and remained inactive for an average of three months after the hospitalized period. Twenty-one patients were treated at home for a similar period. The episodes of nine patients went unrecognized or ignored during the illness. No attempt was made to evaluate the methods of treatment carried out during the acute illness.

TABLE 13.—*Present Complaints in Ninety Patients of the Coronary Disease Group*

Angina pectoris	36	Fatigue	4
Dyspnea	16	Dizziness	2
Limitation of activity without complaints	24	Crippled by gout	1
Palpitation	9	No complaints	18

Prognosis.—Ten patients (nine men and one woman) discussed in this series have died since examination, all presumably from recurrent infarctions; six of these deaths occurred after one additional infarction, three after two additional infarctions, and one after three additional infarctions. Twenty-six others have had additional infarctions, including two who have had a total of three infarctions, and one, a physician, who has had a total of four infarctions and who still carries on a limited practice.

Eighteen of the patients have not restricted their work or activity in any way and have no complaints referable to the cardiovascular system at this time. Twenty-four have voluntarily limited their work or exercise and likewise have no cardiovascular complaints. The remaining 58 patients, except for one man who is crippled by gout, have angina of effort, dyspnea, or a combination of the complaints listed in table 13. Two are heavy users of nitroglycerine, one taking approximately 300 tablets per week.

At this writing (Dec. 1, 1949) the 90 living patients have survived an average of 3 yr. and 11 mo. since the date of the initial acute episode. One man is alive 22½ years after the original episode, though crippled by gout at this time. The 10 patients who have died since our original examination survived an average of three and one-half years, including one who remained alive and active more than 11 years. In the latter group, eight of the 10 had preceding complaints for periods of two months to five years, consisting of mild to severe dyspnea and angina associated principally with effort. Thirty-six patients who had prior complaints, such as angina, dyspnea, or palpitation, continued to have these same complaints frequently and more severely after the infarction. Sixteen patients who listed some complaints beforehand are now symptom-free. The majority of these patients, however, have curtailed their activities and do not extend themselves to the point of inducing angina pectoris, dyspnea, or other symptoms.

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[11] Gertler, M. M.; Garn, S. M., and Lerman, J.: Interrelationship of Serum Cholesterol, Cholesterol Esters and Phospholipids in Health and in Coronary Artery Disease, Circulation 2: 205-214, 1950.

[12] Garn, S. M.; Gertler, M. M., and Hooton, E. A.: Constitutional Aspects of Coronary Heart Disease, to be published.

[13] Garn, S. M.; Gertler, M. M.; Levine, S. A., and White, P. D.: Body Weight Versus Weight Standards in Coronary Artery Disease and a Healthy Group, Ann. Int. Med. 34:1416 (June) 1951.

COMMENT

The clinical examination corroborated the well-known observations of the paucity of clinical findings in persons who have experienced myocardial infarction. One of the most striking observations made was that these men appeared older than their chronological age. With very few exceptions, each person appeared to be at least a decade older than his chronological age. This raised the question that has been considered by Carrel[14] and others: How does the rate of living affect the longevity of the person? These people are mostly mesomorphs, and, being mesomorphs, the energy expended in foot-pounds per unit of day is probably far greater than that expended by ectomorphs, who do not experience the disease with the same frequency.

Cardiac enlargement was ascertained clinically in only five patients, while 22 instances of enlargement were reported by x-ray examinations. Fluoroscopic examination did not reveal more than 10 instances of paradoxical pulsations and diminished pulsations. This number is far less than reported by others; no explanation is apparent for this difference.[9a,b]

In this series 36 patients had no premonitory symptoms prior to the acute episode. Of the 64 who had premonitory symptoms, 41 had angina pectoris, and 20 (all men) thought they had indigestion. The history in the latter group was not definitive enough to warrant a diagnosis of angina pectoris. The number of patients who had premonitory symptoms (64%) is greater than that (50%) reported by Yater and colleagues in their series.[2a]

Ninety-six per cent of the patients experienced substernal or precordial pain immediately prior to the acute episode of myocardial infarction. This pain was severe in 62 patients, moderate in 32, and slight in two. Such a rating is obviously inadequate, for the threshold and interpretation of pain vary in different persons; therefore, any subjective rating is ineffective under optimal conditions. The locations to which the precordial pain radiated were not the classical regions, for in only 29% did the pain radiate down both arms. Furthermore, in 32 instances no pain was observed to radiate from the precordial region.

The question of relationship of effort to coronary heart disease will be discussed in greater detail in a forthcoming publications.[15] Only 11 instances of acute coronary occlusion occurred during sleep. In 21 instances the episodes occurred while the men were engaged in some activity other than their usual occupation. These facts are not meant to suggest that there is a direct causal relationship between effort and myocardial infarction, for these data will not permit such a conclusion. However, it is believed, on the basis of the evidence presented here, that activity, usual or otherwise, may precipitate acute myocardial infarction.

These 100 patients represent a cross section of occupations, from laborers to professional workers. There was a paucity of farmers in this group, for the study was conducted in an urban area where farmers would not be apt to be referred. There is insufficient evidence to consider here the difference of incidence of coronary heart disease in urban and in rural populations.

Coronary episodes occur significantly more frequently in the late fall, winter, and early spring. It is noteworthy that the majority of acute episodes of coronary heart disease occurred during the time of day when most people are engaged in productive activity. Again, this does not prove that there is a direct causal relationship between effort and coronary heart disease, but it is reasonable to conclude that activity may influence the rate of occurrence of the coronary episodes.

The clinical clues to the etiology of coronary heart disease are few but important. Each clue suggested by these observations must be carefully studied and coordinated. The challenge of coronary heart disease must be met by continued effort and study, difficult and unrewarding as it may appear; each additional clue may bring us closer to a final solution of the etiology of coronary heart disease.

SUMMARY

One hundred people (97 men and 3 women) who had experienced myocardial infarction prior to the age of 40 were studied under hospital conditions for periods varying from 24 to 72 hr.

The average age at the time of the first episode was 38⅕ yr. The average survival time at the time of this report is 3 yr. and 11 mo., with a range between nine months and 22½ yr. Thirty-two per cent of the persons in this series were of British Isles mixture, and 27% were Jews. There is a suggestion of seasonal predilection for myocardial infarction, which is confirmed by statistical examination.

Sixty-four per cent of the patients had symptoms prior to the acute attack. Of these, 41 % were classified as angina pectoris. In 96% of the cases, substernal and/or precordial pain immediately preceded the onset of the acute coronary episode. Electrocardiographic, x-ray, and fluoroscopic examinations aided in diagnosis.

The coronary disease group was characterized by (*a*) mesomorphic body build, and (*b*) increased levels of serum cholesterol and serum uric acid, in contrast to the normal population. The coronary disease victims were shorter and wider, with increased anteroposterior chest diameter compared with a control group. They did not, however, weigh more on the average than those in the control group.

There appears to be a definite relationship between the incidence of coronary episodes and the time of day. In 62% of the instances the initial myocardial infarction occurred approximately between 7:30 a. m. and 7 p. m. (or during the average working day). It is thought that activity is not directly related to the myocardial infarction, although it may accelerate previously existing coronary heart disease into myocardial infarction.

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[14] Carrel, A.: Physiological Time, Science 74: 618-621, 1931.

[15] Gertler, M. M.; Garn, S. M., and White, P. D.: The Young Coronary Patient, Monograph, Commonwealth Fund, New York, to be published.

MEPHENESIN IN TREATMENT OF TETANUS

RESULTS OF ORAL ADMINISTRATION IN THREE CASES

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Mephenesin (3-ortho-toloxy-1,2-propanediol) is a synthetic compound which exhibits profound muscle-relaxing properties, and offers a new approach to the treatment of spastic and neurological disorders. The ability of mephenesin to act on the abnormal neuromuscular mechanisms responsible for muscle spasm, spasticity, rigidity, tremor, and dyskinesia has been demonstrated by Schlesinger and associates,[1] by Gammon and Churchill,[2] by Berger and Schwartz,[3] and by others.[4]

Control of the spasms of tetanus, treated by parenteral administration of mephenesin, has been reported in several cases.[5] The oral administration of mephenesin in tetanus has not been extensively reported.[6] It is the object of this paper to present three cases in which tetanus was treated successfully with oral doses of mephenesin in combination with phenobarbital sodium.

REPORT OF CASES

Case 1.—S. H., an 8-year-old Negro schoolboy, was admitted to Jackson Memorial Hospital on June 1, 1949, after an illness of four days' duration. The admission complaints consisted of inability to open his mouth, inability to sit or stand, difficulty in swallowing, and intermittent convulsive seizures of two days' duration. The onset of the illness was accompanied by a temperature elevation to 100 F. rectally. Jerking movements of the extremities had been observed since the onset of the illness. The patient had had generalized convulsive seizures two days prior to hospitalization. He had been able to take only liquids by mouth owing to severe trismus. There was no history of unconscious episodes. The history further revealed that two weeks prior to admission the patient had stepped on a splinter of wood. The fragment was removed and the wound cleaned, and it had apparently healed normally. The patient had been in good health almost all his life and had never contracted any of the childhood diseases. He had had no immunizations.

Physical examination revealed a well-developed but undernourished Negro boy with a blood pressure of 106/80, a pulse rate of 130 per minute, a respiration rate of 20 per minute, and a temperature of 99.6 F. He was unable to sit or stand owing to spastic musculature. Typical risus sardonicus facies with severe trismus, nuchal rigidity, spastic abdominis rectus muscles, and severe spasm of the entire erector spinae group of muscles were noted. The skin was moderately dehydrated, and the heart and lungs were normal. Abdominal examination could not be done owing to spasm. Deep and superficial tendon reflexes were hyperactive. The left heel revealed a healed, nontender, nonfluctuant puncture wound without evidence of peripheral spread of infection from the area. The results of laboratory tests, including urinalysis, complete blood cell count, Kahn test, spinal fluid tests, and sickle cell preparation, were within normal limits.

Course.—The patient was placed in an isolated, quiet room with special nurses. Mild muscular contractions were observed whenever his body was stimulated. Muscular relaxation was obtained initially with tribromoethanol by rectum. Intravenous administration of fluids was started, and 60,000 units of tetanus antitoxin was given intramuscularly. Approximately six hours following admission it was necessary to insert a rubber airway, so that suctioning of tenacious mucus could be carried out. Approximately 11 hours following admission a plastic stomach tube was passed, and two mephenesin tablets (0.5 gm.) were crushed in water and given by tube. An additional 450,000 units of tetanus antitoxin was given by intravenous drip, and surgical excision of the wound of the left heel was carried out. Since the patient had no abnormal reaction to the test dose of mephenesin, one tablet (0.25 gm.) every four hours was prescribed. Since admission the patient had been having muscular spasms lasting from 20 to 30 sec. with boardlike rigidity of the abdomen.

Approximately 12 hours after institution of mephenesin therapy, in combination with phenobarbital, the patient was resting quietly, arousing only when intramuscular injections of penicillin were administered. Tube feedings were retained well. The patient had to be catheterized on two occasions during the first 24 hours of hospital stay because of moderately severe distention of the bladder.

By June 3 the patient's improvement was almost dramatic. He began taking fluid and water by mouth and was able to open his mouth fully. On June 4 be was able to take semisolid food by mouth and began turning himself in bed. Because of some persistence of the tonicity and spasticity of the abdominal muscles, the dose of mephenesin was increased on June 6 to one and one-half tablets (0.375 gm.) every four hours. This increase in the dose seemed to render the patient less hyperexcitable to stimuli, but the spacticity of the abdominal musculature persisted.

The patient continued to improve generally for the next three days, being able to eat and drink almost normally and to move about in bed at will, and he was apparently comfortable. On June 9 the mephenesin medication was discontinued. Within 12 hours the patient was in opisthotonos with spastic musculature. The treatments were resumed, and the response, as before, was good. On June 10 the patient was transferred to another hospital for convalescent care.

Case 2.—G. K., a 6-year-old Negro boy, was admitted to Jackson Memorial Hospital from the emergency room on Sept. 1, 1949, complaining of difficulty in opening his mouth. He had sustained an injury to his right knee 11 days prior to admission, on Aug. 21, 1949. The laceration was sutured by his local physician but no tetanus antitoxin was given. On the day before admission the patient complained of inability to open his mouth. On the day of admission he refused to sit up or eat and complained of pain in his back. He had three generalized convulsions with marked opisthotonos while in the admitting room. The past history revealed no immunizations and measles and chicken pox in 1948.

Physical examination revealed a 6-year-old well-developed and well-nourished Negro boy who was in marked opisthotonos with spastic musculature, a blood pressure of 110/76, a pulse rate of

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Tolserol,® E. R. Squibb & Sons' trademarked brand of mephenesin, was supplied by Dr. H. Sidney Newcomer of E. R. Squibb & Sons, New York.

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3. Berger, F. M., and Schwartz, R. P.: Oral "Myanesin" in Treatment of Spastic and Hyperkinetic Disorders, J. A. M. A. **137**: 772 (June 26) 1948.

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5. Berger, F. M., and Bradley, W.: Muscle-Relaxing Action of Myanesin, Lancet **1**: 97 (Jan. 18) 1947. Gammon and Churchill.[2] Berger and Schwartz.[3]

6. Godman, H. E., and Adriani, J.: Management of Patients with Tetanus, J. A. M. A. **141**: 754 (Nov. 12) 1949. Newcomer, H. S.: Personal communication to the author.

140 per minute, and a temperature of 100.2 F. rectally. While the patient was being observed, he had several tonic and clonic generalized muscular spasms with his legs flexed upon his abdomen, neck hyperextended, and back arched. He was alert and very apprehensive and complained of severe abdominal pain prior to the spasms. He had marked trismus and spasm when stimulated with a tongue blade in his mouth. He was able to open his mouth about 1 in. (2.5 cm.). The chest and heart were normal on examination. The abdomen showed marked spasm of abdominal muscles. The right leg presented an infected swollen wound below the right knee with necrotic purulent debris around an old suture line. The reflexes were all present, equal, and hyperactive.

Course.—Initially the patient was given 125 mg. of isoamylethylbarbituric acid (amytal®) intravenously. Surgical débridement of the infected wound was done, and a lumbar puncture revealed normal spinal fluid. An intravenous injection of 5 per cent dextrose in distilled water with 400,000 units of tetanus antitoxin was started after a negative skin test with horse serum. A plastic stomach tube was introduced, and 3 fluidrachms (12 cc., 1.2 gm. of the drug) immediately and 1 fluidrachm (4 cc., 0.4 gm.) of elixir of mephenesin every four hours was started through the tube. After tolerance and reaction to mephenesin were determined, the dosage was increased to 2 fluidrachms (8 cc., 0.8 gm. of the drug) every four hours at the end of the first 24 hours and to 3 fluidrachms every four hours at the end of 36 hours.

Forty-eight hours after admission, on Sept. 3, the intravenous fluids and medications were stopped and tube feedings were started. The patient was relaxed and moved his extremities freely by this time. Though the muscles were not in spasm, he still lay with his back and neck hyperextended. He continued to have occasional generalized spasm with stimulation.

On Sept. 4 the mephenesin dosage was changed to 2 fluidrachms every two hours, since the muscles of his extremities became very tense between the third and fourth hour following mephenesin medication. Thirty milligrams of sodium phenobarbital every four hours was added to the intratube medicaments. By Sept. 5 the mephenesin had been increased to 3½ fluidrachms (14 cc.) every two hours. The patient was now moving in bed without assistance, though the muscle tone of his extremities was increased. He was taking fluids by mouth without difficulty.

During the next several days the patient was free of spasms, but his abdomen became distended; the condition subsided after manual removal of a fecal impaction. The patient continued to lie with his head and back hyperextended. The mephenesin was increased to 4 fluidrachms (16 cc., 1.6 gm. of the drug) every two hours in an attempt to relax the back muscles, which seemed to be moderately spastic. No relief of the spasm was obtained. The patient was comfortable in this position and could roll from side to side.

Mephenesin treatment was discontinued on Sept. 12 to test the apparent therapeutic response. For the two preceding days the patient had been completely relaxed and responsive. Within 12 hours he was again in marked opisthotonos, complaining of severe pain in his back and extremities. Mephenesin administration was resumed.

On Sept. 13 the patient began taking soft food by mouth, and the tube feedings were discontinued. By Sept. 16 he was ambulatory with assistance; phenobarbital was discontinued, and the mephenesin dosage was changed to one and one-half tablets (0.375 gm.) every four hours. During the next two days the patient became more alert and active. On Sept. 26 he was ambulatory and played about the ward without difficulty. He was walking without difficulty or rigidity with the exception of a slight limp as he favored his healing right leg. The confusion and slow cerebral function which marked the previous two weeks' convalescent period had subsided. Because of the persistence of a temperature of 100 to 101 F. rectally, penicillin was administered throughout the initial period of treatment and was continued for 10 additional days following the return of the temperature to normal. Mephenesin therapy was discontinued, and the patient was discharged on Sept. 30, 1949, without residual findings.

CASE 3.—L. R., a 2½ year old Negro boy from the island of Bimini, was admitted to Jackson Memorial Hospital on Sept. 27, 1949, with the diagnosis of tetanus. About nine days prior to admission he fell, cutting his right knee on a piece of glass. The wound was sutured, and the patient was given penicillin but no tetanus antitoxin. The day prior to admission irritability developed, and the patient failed to play as usual. With the onset of muscular rigidity he was transferred to our hospital. The past history revealed that the child had always been in good health and had had no immunizations.

Physical examination on admission revealed a well-developed, well-nourished, but acutely ill Negro boy in opisthotonos, who had generalized tonic spasms when disturbed by external stimuli or when attempting to expectorate accumulated mucus from the pharynx and throat. Marked trismus prevented complete examination of the mouth and pharynx; the skin was hot and dry, and the right leg presented an infected area measuring 4 by 5 cm. below the right knee. The chest, heart, and abdomen, except for spastic abdominal muscles, were normal on examination. The blood pressure was 115/60, the pulse rate 152 per minute, the respiration rate 36 per minute, and the temperature 101.6 F. rectally.

Course.—The patient was placed in a darkened room with special nurses. He was given immediately 60 mg. of isoamylethylbarbituric acid intravenously to obtain complete relaxation. The wound was débrided by wide surgical excision by the surgical service. Intravenous administration of fluids was started with 5 per cent dextrose, and a plastic tube was placed into the stomach through the nose. The spinal fluid was within normal limits, and a complete blood cell count showed slight anemia. The isoamylethylbarbituric acid injection was repeated as the patient began to arouse. Four hundred thousand units of tetanus antitoxin was added to the intravenous fluids, and 40,000 units was infiltrated around the débrided wound.

Four hours after admission 1 fluidrachm of elixir of mephenesin was added through the tube to test the sensitivity of the patient to the drug. With no apparent reaction to the drug, the patient was given 3 fluidrachms initially and 1 fluidrachm (4 cc.) every two hours through the stomach tube. During the next 18 hours he received a total of 520 mg. of barbiturates in addition to the above medicaments to keep him relaxed. Large accumulations of mucus in the pharynx, which caused convulsions through stimulation, made this sedation necessary. An antihistaminic and penicillin were also prescribed.

On Sept. 28 the mephenesin was increased to 2 fluidrachms every two hours, the phenobarbital to 60 mg. every four hours, and formula feedings were started through the stomach tube. The intravenous fluids were discontinued. The patient was well relaxed but continued to have slight spasms during the day when he aroused from his sedation. The patient's temperature began to spike, and the patient was treated symptomatically with salicylates and alcohol sponges.

On Sept. 30 a diarrhea developed, but it subsided after the sugar was taken from the tube feedings. The patient continued to be satisfactorily sedated and roused at intervals with occasional spasms. He received a transfusion of 250 cc. of whole blood. After a very restless night the mephenesin was increased to 3 fluidrachms every two hours, and the phenobarbital was increased to 90 mg. every four hours. The patient roused frequently during the following day and took sips of water without difficulty.

The patient was continued satisfactorily on this regimen for several days with an average of 10 to 12 mild generalized muscular spasms. He lay with his head in extreme extension and with his back arched, but the muscles involved did not seem spastic in that he could be moved and flexed easily. All the muscles were relaxed except the abdominal muscles, which remained tense during the entire acute stage.

On Oct. 3 the patient had a mild generalized urticarial rash, which was transitory. During the entire acute stage large amounts of mucus accumulated in the pharynx, which was freed by suction and frequent coughing. By Oct. 11 the persistent spiking temperature had returned to normal, and the patient was becoming more active.

The dosage of phenobarbital was gradually decreased to 30 mg. every six hours by Oct. 18. Three days later the patient was taking all food and medicaments by mouth and began talking and jabbering to himself. He was entirely free of spasms.

On Oct. 24 the mephenesin dosage was changed to four capsules (1 gm.) every four hours, and the process of teaching the child to walk again was started. At first he was very rigid, but within three days he was walking with support. Mephenesin was discontinued on this date. During the remaining two weeks in the hospital, the patient became more alert and cheerful. He was treated for ascariasis on two occasions before his discharge, on Nov. 10, 1949. He had no residual of stiffness or spasm on discharge.

COMMENT

An accurate evaluation of the effectiveness of various forms of therapy is extremely difficult, since cases of tetanus vary widely in many respects. However, there are certain general points in the therapy of tetanus which are universally agreed upon, namely, that the control of the spastic, tonic, rigidity state is essential to a beneficial result. By its effectiveness in controlling the spasticity and tonicity of tetanus without toxic manifestations and through its ease of administration, reducing the medical and nursing care, mephenesin has proved in our cases to be a valuable and effective adjunct to the therapy of this disease entity.

From the standpoint of effectiveness, we obtained in all cases adequate muscular relaxation. All muscles were relaxed and free of spasticity with the exception of the abdominal muscles, which remained moderately tense on maintenance dosages of mephenesin. The patient preferred to lie on the side with the back and neck slightly hyperextended, but there was no apparent resistance or discomfort to flexion or movement of the back. The effective dosage of mephenesin necessary for the control of spasm varied in all cases. When either the elixir or the tablet was used, the dosage was gradually increased until therapeutic effect was achieved. When mephenesin was combined with phenobarbital, the convulsions were controlled within a period of 24 to 48 hours following admission. Maintenance doses of phenobarbital never exceeded the amount necessary to produce light sleep, from which the patient easily could be aroused. The daily maintenance dosage of mephenesin for satisfactory muscle relaxation was 2.25 gm. in the first case, 19.2 gm. in the second, and 14.4 gm. in the third. We found that administration of the drug at two hour intervals was more effective in maintaining adequate muscle relaxation.

In a hyperexcitable state any medication which minimizes the amount of patient trauma is efficacious. The drug was administered through a flexible plastic stomach tube, obviating trauma such as is caused by repeated intramuscular and intravenous medications. The plastic tubes produced far less local trauma and irritation than the conventional rubber stomach tubes and could be left in place during the entire course of treatment.

We feel that mephenesin, by its ability to produce adequate muscular relaxation early in the disease process, substantially reduced the special medical and nursing care previously required in such cases.

In our cases we observed no toxic manifestations from mephenesin, despite the use of rather large dosages. Hematuria, anemia, leukopenia, respiratory depression, lassitude, and abdominal distention, all toxic signs seen following the use of mephenesin parenterally, were not observed when the oral route of administration was used.

Realizing that no definite conclusions can be drawn from such a small number of cases, we do, however, feel that our results warrant further investigation of this drug as a valuable adjunct to the therapy of tetanus.

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VALUE OF CHOLESTEROL ESTERS IN DIFFERENTIAL DIAGNOSIS OF JAUNDICE

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The presence of jaundice in a patient is a distinct concern to the clinician. He is confronted at the outset with its medical or surgical implications. For the differentiation of this jaundice, a number of clinical and laboratory methods are available; of these, the cholesterol ester fraction has been of particular interest to us.

In a discussion of the subject, Sidney A. Portis,[1] on the basis of his clinical observations, remarked that in obstructive jaundice the cholesterol esters are often diminished before any other liver function tests give abnormal results. A review of the literature revealed a number of contradictory statements on this matter.

The significance of a low cholesterol ester ratio of the serum in cases of parenchymatous jaundice has been well established.[2] It has been generally agreed that the liver cell esterifies cholesterol and that injury to the liver cell or decrease of its function interferes with this activity.[3] A low cholesterol ester content may, therefore, be due to inability of the hepatic cell either to esterify cholesterol or to release it into the blood stream.[4] In obstructive jaundice, however, a high total cholesterol with a relative increase of the ester ratio is frequently expected.[5] Only in later stages of biliary obstruction, as the liver cell becomes more and more damaged by the obstruction or by infection, do the esters begin to fall and reach values observed in parenchymatous jaundice, according to many authors.[6] This phenomenon has been studied experimentally by Hawkins and Wright [2h] and others.[7]

The cholesterol ester ratio in early stages of jaundice has been used as one of the diagnostic criteria for the differentiation between parenchymatous and obstructive jaundice.[8] It occurred to us that some cases of proved obstructive jaundice exhibited low cholesterol ester values in relatively early stages of obstruction, without any pronounced changes in other liver function tests. We decided, therefore, to analyze such cases, in order to evaluate the frequency and clinical significance of this phenomenon.

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[1] Portis, S. A.: Diseases of the Digestive System, ed. 2, Philadelphia, Lea & Febiger, 1944, p. 345.

MATERIALS AND METHODS

Sixty-one cases observed on the surgical and medical services of Michael Reese Hospital during the past two years provided the material for this study. The diagnosis was established by clinical histories, physical findings and either surgical exploration or autopsy. In 15 cases either liver biopsies or specimens obtained at autopsy were examined histologically. The cholesterol and its esters were determined by the method of Schoenheimer and Sperry.[9] The methods for the other liver function tests were the same as those used routinely in Michael Reese Hospital. The cases were analyzed according to the cause of obstruction: (1) those due to biliary calculi and benign stenosis and (2) those due to neoplasms of the bile ducts or surrounding structures.

RESULTS

Case histories and duration of jaundice are not included in the tables so that extensive tabulation is avoided. Of the 42 cases of obstruction due to calculi or benign stenosis, six (15 per cent) showed an abnormally high total cholesterol (table 1). In 18 cases (42 per cent) the cholesterol ester ratio was low. The distribution according to the actual values is evident from the table. Comparison of the results in the other liver function tests in this group except for the serum bilirubin test indicates that only the results of the alkaline phosphatase test were abnormal in a number of cases approximately equal to those which showed abnormalities of the cholesterol esters (table 2). This elevation of phosphatase has generally been assumed to represent an indication of biliary obstruction. The other liver function tests used to assess the liver cell damage show abnormal values in a much lower percentage of the cases. This indicates clearly that there are a considerable number of cases in this group which show low cholesterol ester values, with normal values in the other liver function tests.

TABLE 1.—*Results of Total Cholesterol and Cholesterol Ester Tests*

	Cause of Obstruction			
	Stones and Stenosis		Carcinoma	
Liver Function Test	No. of Cases	Percentage *	No. of Cases	Percentage *
Total cholesterol, mg. per 100 cc. (normal, 120-300)				
50-120	3	7	0	0
121-300	33	78	13	68
301-400	4	9	0	0
401 plus	2	6	6	32
Cholesterol esters, per cent (normal, 61-74)				
0-10	0	0	1	5
11-20	1	2	3	15
21-30	3	7	0	0
31-40	3	7	5	25
41-50	4	9	2	10
51-60	7	17	3	15
61-70	22	52	4	20
71-80	2	6	1	5

* Percentage figures are approximate.

An analysis of our material reveals that there is a definite correlation between the duration of the icterus and the low cholesterol ester level. Of 26 cases of biliary obstruction due to biliary calculi or stenosis in which the jaundice was noticed for seven days or less, only one showed an elevation of the total cholesterol. Three of these patients showed low cholesterol esters although the other liver function tests gave normal results in each instance. The first patient obviously had a chronic hepatic disease secondary to chronic cholecystitis, with the acute episode being caused by a stone at the ampulla. Another patient had liver disease evidently of longer duration, as shown by the autopsy findings. The third patient also had extensive chronic liver disease after calculi. The other patients in this group, all exhibiting normal cholesterol ester values, had an acute onset without a history or pathological evidence of previous biliary disease.

TABLE 2.—*Abnormal Values in Liver Function Tests*

	Cause of Obstruction			
	Stones and Stenosis		Carcinoma	
Liver Function Test	No. of Cases	Percentage *	No. of Cases	Percentage *
Serum bilirubin	42	100	19	100
Alkaline phosphatase	28	66	16	84
Thymol flocculation	1	2	4	20
Cephalin flocculation	8	19	2	10
Total protein	2	6	1	5
Albumin	3	7	6	32
Globulin	13	31	8	42
Prothrombin time	2	6	3	15

* Percentage figures are approximate.

Of the 16 cases in this group which were jaundiced for a duration of 10 days to three months, 12 showed definitely low cholesterol ester values. There was no correlation with the absolute total cholesterol levels, some of which were low. The lowest ester value in this group was 25 per cent. Except for four cases in which the results of other liver function tests were abnormal, there were no other laboratory findings indicative of liver cell disease in the remaining cases. Of particular interest was one patient in whom jaundice developed after ligation of the common bile duct at the time of cholecystectomy. She had a very low ester percentage, with a high total cholesterol.

The alkaline phosphatase was high in most of the cases of this entire series. Protein fractionation was not considered a test specific for liver function.

Biopsies and autopsies in this group showed hyperplasia in the bile ducts, periportal fibrosis with lymphocytic infiltration and, in some of the cases, cloudy swelling and early degeneration of the liver cells. This pathology was found to be the same in practically all the

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2. (*a*) Portis.[1] (*b*) Bockus, H. L., and others: Gastro-Enterology, Philadelphia, W. B. Saunders Company, 1946, vol. 3, p. 86. (*c*) Cantarow, A.: Biliary Stasis and Decompression: A Review of Recent Contributions, Internat. Clin. **1**: 272, 1938. (*d*) Epstein, E. Z.: The Cholesterol Partition of the Blood Plasma in Parenchymatous Diseases of the Liver, Arch. Int. Med. **47**: 82 (Jan.) 1931. (*e*) Epstein, E. Z.: Cholesterol of the Blood Plasma in Hepatic and Biliary Diseases, Arch. Int. Med. **50**: 203 (Aug.) 1932. (*f*) Epstein, E. Z., and Greenspan, E. B.: Clinical Significance of the Cholesterol Partition of the Blood in Biliary Diseases, Arch. Int. Med. **58**: 860 (Nov.) 1936. (*g*) Greene, C. H.; Hotz, R., and Leahy, E.: Clinical Value of Determination of Cholesterol Esters of Blood in Hepatic Disease, Arch. Int. Med. **65**: 1130 (June) 1940. (*h*) Hawkins, W. B., and Wright, A.: Blood Plasma Cholesterol: Fluctuations Due to Liver Injury and Bile Duct Obstruction, J. Exper. Med. **59**: 427, 1934. (*i*) MacFee, W. F.: Painless Jaundice, J. A. M. A. **141**: 171 (Sept. 17) 1949. (*j*) Schiff, L.: The Differential Diagnosis of Jaundice, Chicago, The Year Book Publishers, Inc., 1949. (*k*) Thannhauser, S. J.: Lipidoses: Diseases of the Cellular Lipid Metabolism, in the Oxford Medicine, New York, Oxford University Press, 1949, vol. 4, pt. 1, pp. 41, 88 and 214.

3. (*a*) Thannhauser.[2k] (*b*) Cantarow, A., and Trumper, M.: Clinical Biochemistry, Philadelphia, W. B. Saunders Company, 1939, pp. 179-189, 460, 461 and 510. (*c*) Steigmann, F.; Popper, H., and Meyer, K. A.: Liver Function Tests in Clinical Medicine, J. A. M. A. **122**: 279 (May 29) 1943. (*d*) Thannhauser, S. J.: Serum Lipids and Their Value in Diagnosis, I, New England J. Med. **237**: 515, 1947. (*e*) Thannhauser, S. J.: Serum Lipids and Their Value in Diagnosis, II, New England J. Med. **237**: 546, 1947.

cases examined and was similar to the pathology of the liver in obstructive jaundice as described in the literature.[10]

Of the 19 cases of obstruction due to neoplasms a low cholesterol ester ratio appeared in 14 instances (70 per cent) (table 1). In the cases in which normal values were exhibited they were of short duration. Each case in which the jaundice persisted for more than eight days showed a significant drop in esters, some of them reaching extremely low levels. High total cholesterols were more frequent in this group than in the previous one, and a low total cholesterol value was not encountered here. Six patients in this group (32 per cent) showed an abnormally high total cholesterol. With the exception of the protein determination, in only four of these cases were the results of the other liver function tests abnormal, indicating hepatocellular damage.

The liver pathology in this group was essentially the same as in the previous series, with the addition of multiple metastatic lesions in many of them.

COMMENT

From the cases examined, it appears that the cholesterol esters may be significantly lowered in some cases of obstructive jaundice, which, with the exception of an elevated serum bilirubin and alkaline phosphatase, showed no or only few abnormalities in the liver function tests commonly used for the assessment of the hepatocellular function. The reduction of the cholesterol esters was noticed in the cases of obstruction due to calculi or benign stenosis, but was more pronounced in cases of obstruction due to neoplasms. The time factor was important in both groups, in that the reduction was commonest after the first week of jaundice.

The absolute values for the cholesterol esters obviously depended on the figures for total cholesterol. Although the ester percentage was lower in the group of malignant tumors, the total cholesterol values were higher than in the benign obstructions, and, therefore, the absolute values were, with one exception, higher than in the cases of obstruction due to benign processes.

Similar observations were made by Man and his coworkers,[11] who explained the relative and absolute diminution of esters on the basis of lack of excretion of free cholesterol in the bile.

As was stated before, the liver cell is the site of cholesterol esterification and release of the esters. It has been generally assumed, therefore, that the fall of cholesterol esters in biliary obstruction is a manifestation of secondary liver cell damage. The questions arise then, why in so many cases this is the first and only liver function test to give abnormal results, and why the results of the other tests commonly used should remain normal. Is the liver cell damage occurring in obstruction of a different type from the one encountered in hepatitis? Does damage resulting from biliary obstruction primarily affect the enzyme system necessary for cholesterol esterification?

Meyer, Popper, and Steigmann [6n] recently discussed the question of biliary hepatitis, that is, parenchymal damage due to extrahepatic biliary obstruction. These authors pointed out that infection is not necessarily a factor and confirmed the impression that increased pressure of the duct system seems to play a major role. The histological picture has been described as a "pure" biliary hepatitis differentiated from the purulent hepatitis. The mean figures given by the authors for cholesterol esters appear significantly lowered, although they do not permit a correlation with the values in other hepatic function tests in each case. Our findings concur with their observation that lower cholesterol ester values occur in malignant obstruction rather than in benign obstruction. Our results also agree with the statement by Ottenberg and Colp and Watson [12] that a low total cholesterol concentration is of particular value to one in ruling out obstruction of the biliary tract by tumor. Our own observations did not permit any correlation between the histological findings and cholesterol ester values.[13]

It becomes evident that in the differential diagnosis of jaundice the cholesterol ester value alone does not permit clinical differentiation between obstruction and primary liver cell damage. This has been stated by several investigators.[14] On the other hand, we may say that a case of jaundice which shows a low cholesterol ester ratio in the presence of normal values for other commonly used liver function tests is likelier to be due to extrahepatic biliary obstruction than to primary hepatitis.

Portis [1] expressed a similar view, and our own studies corroborate his observation. It also appears from our investigations that low cholesterol esters in obstructive jaundice may present a relatively early sign and do not necessarily occur in the later course of the disease. It may

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4. (*a*) Portis.[1] (*b*) Steigmann, Popper and Meyer.[3c] (*c*) Thannhauser, S. J., and Schaber, H.: Über die Beziehungen des Gleichgewichtes Cholesterin und Cholesterinester im Blut und Serum zur Leberfunktion, Klin. Wchnschr. **5**: 252, 1926. (*d*) Weinhouse, S.: The Blood Cholesterol, Arch. Path. **34**: 438 (March) 1943.

5. (*a*) Bockus and others.[2b] (*b*) Epstein.[2e] (*c*) Epstein and Greenspan.[2f] (*d*) Greene, Hotz and Leahy.[2g] (*e*) Hawkins and Wright.[2h] (*f*) Schiff.[2j] (*g*) Cantarow and Trumper.[3b] (*h*) Weinhouse.[4d] (*i*) Lichtman, S. S.: Diseases of the Liver, Gallbladder and Bile Ducts, Philadelphia, Lea & Febiger, 1949, pp. 252 and 257. (*j*) Shay, H., and Fieman, P.: The Value of a Combined Study of the Newer Laboratory Test in the Differential Diagnosis of Toxic and Obstructive Jaundice Including Blood Phosphatase, Cholesterol Partition, Galactose Tolerance, and Glucose Tolerance, Am. J. Digest Dis. **5**: 597, 1938.

6. (*a*) Portis.[1] (*b*) Bockus and others.[2b] (*c*) Cantarow.[2c] (*d*) Epstein.[2e] (*e*) Epstein and Greenspan.[2f] (*f*) Greene, Hotz and Leahy.[2g] (*g*) Hawkins and Wright.[2h] (*h*) Thannhauser.[2k] (*i*) Cantarow and Trumper.[3b] (*j*) Steigmann, Popper and Meyer.[3c] (*k*) Thannhauser.[3e] (*l*) Weinhouse.[4d] (*m*) Shay and Fieman.[5j] (*n*) Meyer, K. A.; Popper, H., and Steigmann, F.: Biliary Hepatitis, Quart. Bull. Northwestern Univ. M. School **23**: 321, 1949.

7. Chanutin, A., and Ludewig, S.: The Blood Plasma Cholesterol and Phospholipid Phosphorus in Rats Following Partial Hepatectomy and Following Ligation of the Bile Duct, J. Biol. Chem. **115**: 1, 1936. Stern, R., and Suchantke, G.: Über die klinische Bedeutung des Cholesterins in der Galle und im Blutserum: III. Mittleitung: Das Gleichgewicht von *Cholesterin und Cholesterinester im Blutserum bei gestörter Leberfunktion*, Arch. exper. Path. u. Pharmakol. **115**: 221, 1926. von Rosztóczy, E.: Über das Verhalten des freien und Ester–Cholesterins im Blute und in den Organen des Kaninchens bei künstlicher Gallenstauung, Ztschr. f. d. ges. exper. Med. **68**: 690, 1929.

8. Epstein and Greenspan.[2f] Greene, Hotz and Leahy.[2g] Cantarow and Trumper.[3b] Weinhouse.[4d] Shay and Fieman.[5j]

9. Schoenheimer, R., and Sperry, W. M.: A Micromethod for the Determination of Free and Combined Cholesterol, J. Biol. Chem. **106**: 745, 1934.

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again be pointed out though that a single test will not permit the evaluation of the pathological physiology of such a complex process as is encountered in a case of extrahepatic biliary obstruction.

SUMMARY

In a survey of 61 cases of obstructive jaundice proved by surgery or autopsy, the total cholesterol and the cholesterol ester ratio are evaluated. In cases of obstruction due to stone or benign stenosis, a reduction of the cholesterol esters was frequently observed in the absence of abnormal results in liver function tests commonly used for evaluation of hepatocellular damage. This was found to be commoner after the first week of obstruction. In obstruction due to malignancy, the relative cholesterol ester content showed an even greater reduction. We conclude, therefore, that the cholesterol ester ratio is of no significance in the differential diagnosis between obstructive and hepatocellular jaundice. On the other hand, a low cholesterol ester value in the presence of normal values in liver function tests suggests mechanical obstruction.

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11. Man, E. B.; Kartin, B. L.; Durlacher, S. H., and Peters, J. P.: The Lipids of Serum and Liver in Patients with Hepatic Diseases, J. Clin. Investigation **24**:623, 1945.

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EVALUATION OF RADIOPHOSPHORUS THERAPY IN PRIMARY POLYCYTHEMIA

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During the past decade, radiophosphorus has become a widely accepted agent for the treatment of primary polycythemia, and favorable experience with it has been reported by a number of investigators.[1]

In the eight year period from Jan. 1, 1942 through Dec. 31, 1949, 199 patients who had primary polycythemia have been treated with radiophosphorus at the Mayo Clinic. This group included 78 women and 121 men varying in age from 25 to 73 years, with a mean age of 54 years. The case records of this entire series were of value in the analysis of most pretreatment features. In the consideration of posttreatment features, inadequacy of treatment, failure to return, and recentness of treatment have reduced this total group to 148 patients.

In addition to the foregoing, we have considered a group of 32 patients with primary polycythemia who were treated with means other than radiophosphorus (phlebotomy, phenylhydrazine, and roentgen therapy), and the cause of whose death is known. In 10 patients of this group, necropsy had been performed at the clinic or elsewhere.

For the purpose of this study, the basic criteria of the primary polycythemic state are (1) a sustained elevation of the erythrocyte count at more than 6,000,000 cells per cubic millimeter of blood and (2) sustained elevation of the hematocrit or erythrocyte volume at more than 55% in the presence of a normal or increased total blood volume (Congo red method). In this fundamental set of criteria must be included anamnestic evidence that the polycythemia was sustained and not transient and objective evidence excluding known causes of secondary or relative polycythemia.

In addition to the foregoing basic criteria, there may be indications of myeloid hyperactivity as manifested by the presence of immature myeloid cells in the peripheral blood or hyperleukocytosis. In this study, the significant level of leukocytosis is set at 15,000 cells per cubic millimeter of blood.

Palpable splenomegaly may be present, and there may be hyperuricemia (uric acid levels of more than 6.0 mg. per 100 cc. of serum).

In this study, we have called special attention to cases in which the total blood volume was elevated. The upper limit of normal for this determination in our laboratories is 100 cc. per kilogram of body weight. To make this criterion unequivocal, we have chosen 110 cc. per kilogram as the lower figure for significant elevation of the total blood volume.

PRETREATMENT EVALUATION

The analysis of our data before treatment is considered under the following topics: (1) duration and subjective symptoms; (2) degree of elevation of the erythrocyte volume; (3) degree of myelopathy; (4) presence of hyperuricemia; (5) degree of splenomegaly; (6) incidence of vascular complications; (7) response to treatment other than radiophosphorus; (8) patterns in primary polycythemia.

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[1] (*a*) Reinhard, E. H.; Moore, C. V.; Bierbaum, O. S., and Moore, S.: Radioactive Phosphorus as a Therapeutic Agent: A Review of the Literature and Analysis of the Results of Treatment of 155 Patients with Various Blood Dyscrasias, Lymphomas, and Other Malignant Neoplastic Diseases, J. Lab. & Clin. Med. **31**:107 (Feb.) 1946. (*b*) Lawrence, J. H.: The Control of Polycythemia by Marrow Inhibition: A 10 Year Study on 172 Patients, J. A. M. A. **141**:13 (Sept. 3) 1949. (*c*) Hall, B. E., and Watkins, C. H.: The Medical Use of Radioactive Isotopes: I. Radioactive Isotopes in Hematologic Disturbances and Neoplasms, Am. J. M. Sc. **213**:621 (May) 1947. (*d*) Hall, B. E., and Watkins, C. H.: Radiophosphorus in the Treatment of Blood Dyscrasias, M. Clin. North America **31**:810 (July) 1947. (*e*) Hall, B. E.: Therapeutic Use of Radiophosphorus in Polycythemia Vera, Leukemia, and Allied Diseases, in a Symposium on the Use of Isotopes in Biology and Medicine, Madison, Wis., University of Wisconsin Press, 1948, pp. 353-376. (*f*) Hall, B. E.: Radiophosphorus Therapy, Cancer Research **8**:383 (Aug.) 1948.

Duration and Subjective Symptoms.—The early symptoms of polycythemia may be very mild, and the onset insidious. Occasionally, however, in a patient under close observation the polycythemic state will develop acutely. For these reasons, statements of the duration of the disease are likely to be inaccurate and must be regarded as approximations.

In the series later treated with radiophosphorus, an estimate of duration was possible in 162 cases. Here the mean duration was 49.5 months. The range varied from "less than a year" to 20 years. The relation of duration and pattern of disease will be discussed later.

It must be emphasized that though relief of subjective symptoms is an important criterion in the judgment of therapy in primary polycythemia, inadequate therapy will often afford such striking relief of symptoms that change in the subjective character of the patient does not afford a reliable guide to therapy. In earlier papers, one of us (Hall)[2] has described the subjective symptoms of many of the group treated later with radiophosphorus and has pointed out the striking relief of symptoms in this method of treatment. In this present study, we have confined our observations to certain crucial objective findings.

Degree of Elevation of the Erythrocyte Volume.—As stated previously, this criterion is fundamental to the definition of primary polycythemia, and for purposes of definition we have arbitrarily selected hematocrit values of 55% or more as critical. Ninety-six (53%) of 182 cases in the radiophosphorus series exhibited total blood volume of more than 110 cc. per kilogram before treatment.

Degree of Myelopathy.—Leukemoid reactions (either the presence of immature leukocytes in the peripheral blood or more than 15,000 leukocytes per cubic millimeter of blood) were noted in 62 (32%) of 194 cases. Marked leukemoid reactions were noted in 10 cases (5%).

Presence of Hyperuricemia.—Elevation of the uric acid values to more than 6.0 mg. per 100 cc. of serum was noted in 46 (27%) of 169 cases in which this observation was made.

Degree of Splenomegaly.—The spleen was readily palpable in 130 (65%) of the total series of 199 cases.

Incidence of Vascular Complications.—In 62 (31.1%) of the total series of 199 cases there was a history of some sort of vascular accident prior to radiophosphorus therapy (hemorrhage 8.5%, thrombosis 19.6%, and both 3.0%).

Response to Treatment Other Than Radiophosphorus.—In 96 (48%) of the total series of 199 cases, some type of therapy other than radiophosphorus had been given prior to radiophosphorus treatment. In the majority of cases this had consisted of bleedings and phenylhydrazine. In a few cases roentgen therapy had been given over the long bones and the spleen. Four patients had received nitrogen mustard therapy with remissions of less than a year's duration. To our knowledge, none of the patients had been treated with "spray radiation." One patient was treated with bleeding and a low iron diet, but, in spite of this regimen, his polycythemia rapidly recurred.

In many instances, sufficient details of previous therapy were lacking, so that an accurate comparison with the later treatment with radiophosphorus was not possible. However, all patients accepted for treatment with radiophosphorus were in relapse, and with one or two exceptions, treatment that had been used before had not been notably successful in producing long remissions of a year or more (the criterion set up for judgment of the effect of radiophosphorus). In many cases, there had never been good objective control of the polycythemic state, but it should also be pointed out that patients receiving other forms of therapy were rarely, if ever, under the rigorous observation and control imposed on those receiving radiophosphorus. However, frequent bleeding and dietary restrictions impose a burden that few patients will accept over a long period of time. The difficulties in the use of phenylhydrazine are well known and need not be reviewed.

Patterns in Primary Polycythemia.—The foregoing incidences give only a piecemeal view of primary polycythemia. It is well known that certain factors are correlated in combinations to form certain patterns. First, there is the type largely characterized by the increased erythrocyte volume without striking evidence of other phases of myelopathy. Another well-known type is seen in the case with polycythemia plus evidence of other forms of myelopathy such as myeloid immaturity and thrombocytosis. In a third type the hematologic picture of either the first or second type described above occurs along with a history of vascular accidents.

The review of a series such as this, as is evident from the earlier paragraphs dealing with pretreatment data, shows that the first and second types represent relative extremes and are, in a sense, ideal. It is a debatable question where to draw the line of significant leukemoid reaction or leukocytosis in the peripheral blood. Nor can quantitative measure of the different fractions of the bone marrow give more than a relative answer. Neither is the significance of splenomegaly or hyperuricemia wholly appreciable in pretreatment analysis.

Often the original analysis of a given case is based on a single observation period. This may have followed a period of treatment with some other agent, which alters the picture considerably.

It is often assumed that "simple" polycythemia (that is, without evidence of panmyelopathy or complications) represents an early or mild form of a single disease and that if the disease continues long enough without a fatal vascular accident, increasing degrees of panmyelopathy will appear so that the terminal hematologic picture is either a myelocytic leukemia, an aplastic anemia, or a myelofibrosis with myeloid metaplasia.

The long history of the disease and the possibility of an easy form of treatment (bleeding) make attempts to know the natural course of the untreated disease or diseases virtually impossible. Nevertheless, an analysis of cases comparing incidence of leukemoid reaction with duration may be attempted for suggestive reasons.

In 143 cases of estimated duration of less than 10 years, 85 cases (59.5%) were of the "simple" type, and 58 cases (40.5%) exhibited a leukemoid reaction or leukocytosis. In 17 cases of estimated duration of more than 10 years, five cases (29.5%) were of the "simple" type, and 70.5% showed a leukemoid reaction or leukocytosis. It is apparent in this series that there is a higher percentage of cases of simple polycythemia in the group of shorter duration, while in the group of longer duration, there is a higher percentage of cases with leukemoid reactions. However, it is worthy of note that cases of "simple polycythemia" may be of considerable duration.

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[2] Footnotes 1c through 1f.

One might infer from this that there is a tendency for older cases of polycythemia to become more myelopathic. However, the possibility must be considered that there is another fate for some cases of simple polycythemia. It is possible that some of these cases revert to normal, but we lack any documented record of this.

Another possibility is that the "simple polycythemias" may have a higher mortality rate in the earlier years from vascular accidents, although it would be difficult to see why this might be. In the pretreatment group of 62 cases in which there were histories of vascular accidents, in 31 cases (50%) there was no evidence of leukemoid reaction at the time of examination. In five cases, there were inconclusive data, and in the remaining 26 cases there were varying degrees of leukemoid reaction. From these data, it is thus impossible to associate vascular accidents with the presence or absence of panmyelopathy.

While these problems are of major importance in the characterization of primary polycythemia with no treatment or treatment other than radiophosphorus for comparison with primary polycythemia treated with radiophosphorus, they cannot be categorically settled at this time. For the present, it is a matter of being confronted with certain features sometimes grouped into combinations and noting what bearing they have on successful response to radiophosphorus therapy.

The combination of polycythemia, splenomegaly, and leukemoid reaction (immature cells in the peripheral blood) was noted in 48 of 194 cases (24.3%). Within this group there were 10 cases (5%) which showed very marked leukemoid reactions.

The combination of leukemoid reaction, splenomegaly, and hyperuricemia was seen in 17 cases out of 169 cases (10.1%). The combination of hyperuricemia and splenomegaly without leukemoid reaction was seen in eight cases (4.7%) out of 169.

Causes of Death in Primary Polycythemia Not Treated with Radiophosphorus.—For further comparison with the radiophosphorus series, study was made of the records of 32 patients who had had primary polycythemia, had received therapy other than radiophosphorus, and the cause of whose death was known. The methods of therapy employed consisted of bleeding alone, bleeding and phenylhydrazine, or roentgen therapy to the spleen and long bones. This group consisted of 19 men and 13 women with ages ranging from 30 to 74 years, the average age being 50.4 years.

In this group, the proportion of deaths from vascular accidents was very high, more than half (56.3%) of the group succumbing to thrombosis or hemorrhage. Leukemia accounted for 12.5% of the deaths (table 1).

While the group is not large, the distribution of the causes of death may be compared with duration of the disease from time of diagnosis. More than 80% (26 deaths) of the deaths in this group occurred within the first 10 years after diagnosis. During this first decade, the majority of the deaths (17) were from vascular accidents. The four cases of leukemia occurred in the second decade or later.

The study of a group of cases such as this emphasizes the high risk of vascular accidents in the case of primary polycythemia in which treatment is inadequate or absent. The appearance of leukemia in the second decade points out the necessity of a 20 year observation period before any definite conclusions about leukemia in polycythemia can be made, and the question of how many patients who might later have had leukemia died of vascular accidents early in the disease remains unsettled.

RESULTS OF TREATMENT WITH RADIOPHOSPHORUS

The method of radiophosphorus treatment[3] of primary polycythemia used at the Mayo Clinic consists of the following steps: (1) Venesections of 500 cc. each are repeatedly performed until the hematocrit has reached a level of 55% or less. In older persons or in persons who experience syncope with bleedings of 500 cc., lesser amounts are withdrawn, with a somewhat longer time interval between the bleedings. (2) When the hematocrit is at the desired level, radiophosphorus is administered. Radiosphosphorus is obtained as dibasic sodium phosphate in sterile isotonic saline solution. In the vast majority of instances, it is given intravenously. A very rare instance will require oral administration, in which case the dose must be increased approximately 30% to allow for failure of absorption. The initial dose given intravenously varies from 5 to 7 millicuries, depending on the therapist's judgment of the severity of the disease. (3) Thereafter, at intervals of six to eight weeks, the patient returns for blood examination at which time the hematocrit, hemoglobin, erythrocyte count, leukocyte count, platelet count, and morphologic study of a blood smear are done. (4) As long as the blood values are within normal limits (as defined previously) or low, no further radiophosphorus therapy is undertaken. When the polycythemic state recurs, the injection of radiophosphorus is repeated. A "course" consists of intravenous injections of radiophosphorus at intervals of six to eight weeks until a remission is obtained.

TABLE 1.—*Causes of Death of 32 Patients with Primary Polycythemia Treated with Means Other Than Radiophosphorus*

Cause of Death	No.	Percentage
Thrombosis		
Coronary	8	25.0
Mesenteric	3	9.4
Hepatic vein	1	3.1
Hemorrhage		
Cerebral	3	9.4
Gastrointestinal	3	9.4
Chronic myelocytic leukemia	4	12.5
Malignant tumors	4	12.5
Peritonitis	2	6.2
Others	4	12.5

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[3] Stroebel, C. F., and Hall, B. E.: Radiophosphorus in the Treatment of Polycythemia Vera and the Leukemias, in Hahn, P. F.: A Manual of Artificial Radioisotope Therapy, New York, Academic Press, 1951.

In our experience, radiation sickness and local thrombophlebitis associated with the administration of radiophosphorus are virtually unknown.

The review of our series of 199 cases in which primary polycythemia was treated with radiophosphorus led to a rejection of 51 cases because of inadequate treatment, failure to give subsequent report, or therapy too recent to justify conclusions. Thus the evaluation of therapy is based on 148 cases.

The criteria used in the judgment of response to therapy are as follows: (1) Successfully treated: A complete remission of the polycythemic state developed after a course of radiophosphorus, and this remission lasted at least one year. The determination of "remission" is based entirely on objective data: the persistence of the erythrocyte count and hematocrit at normal or slightly subnormal levels. In this group, no striking abnormalities were noted in posttreatment leukocyte or thrombocyte counts or morphology.

(2) Successfully treated but hematologic complications developed: These patients had remissions from their polycythemia for at least a year, but a major hematologic abnormality other than recurrence of the polycythemia subsequently developed. The abnormalities noted consisted of anemia, leukemoid reaction, or even frank leukemia. Because of inadequate follow-up data in some instances, it is not always possible to state whether the anemia and leukemoid reaction seen represent myelocytic leukemia or myelofibrosis with myeloid metaplasia.

TABLE 2.—*Radiophosphorus Treatment of Primary Polycythemia: Distribution of Types of Response*

Type of Response	Patients	Percentage
Successfully treated	112	75.7
Successfully treated but hematologic complications developed	7	4.7
Failure	24	16.2
Failure with hematologic complication	5	3.4
	148	100.0

(3) Failure: In these patients, the amount of radiophosphorus given was comparable to or in excess of the amounts given in the first two groups, but these amounts were ineffective in producing remissions of at least a year. In this group, short remissions were often obtained, but it is particularly difficult in these cases to know if the remission was due to the bleeding program or to the radiophosphorus. If the criterion of success were based on a remission period of six months, the group of "failures" would be much smaller than that based on a remission period of one year. The selection of the period of a year or more was made, since in our experience remissions of this length are very uncommon when bleeding alone, bleeding and phenylhydrazine, or nitrogen mustard therapy is used. Many of the patients in the "failure" group obtained striking subjective remissions even though there was an early recurrence of polycythemia or only partial control achieved.

(4) Failures with hematologic complications: In this group there was no remission of the polycythemia lasting a year or more, and anemia, leukemoid reaction, or frank leukemia subsequently developed.

The observation period on 148 cases varied from one to eight years with a median observation period of 2.5 years. The mean observation period was 3.6 years.

The frequency of the type of response is indicated in table 2. In 80.4% of cases in which adequate amounts of radiophosphorus were given, a remission of the polycythemia state of at least one year's duration was obtained, and in many instances this was successfully repeated. This, however, includes seven cases (4.7% of 148 cases) in which anemia, leukemoid reactions, or frank leukemia developed. In 19.6% of the suitable cases studied, remissions of at least a year were not obtained; hence the cases are classified as "failures."

TABLE 3.—*Primary Polycythemia Successfully Treated with Radiophosphorus: Distribution of Pattern of Response*

Pattern of Response	Cases No.	Cases Percentage
Remissions with 7.0 mc. or less per course	47	42.0
Initial remission required more than 7.0 mc. but subsequent remissions induced with 7.0 mc. or less	16	14.3
Remissions required 7-15 mc.	38	33.9
Remissions required more than 15 mc.	11	9.8
	112	100.0

To obtain successful remissions, on the average, one or two intravenous injections yielding a dosage per course of 9 to 10 millicuries were required. The average remission obtained lasted well over one year (1.6 years).

Review of cases in which treatment was successful has shown that these usually fall into one of four groups of patterns of response to treatment, that is, a given patient will often respond in a similar manner with successive courses. In the first group (table 3) are patients who respond readily to relatively small amounts of radiophosphorus. In the second group, the initial remission may be obtained only after multiple injections, but once the remission has been obtained, successive remissions are obtained with relatively small doses of radiophosphorus. The last two groups are arbitrarily based on "moderate" requirements for remissions (7 to 15 millicuries per remission), and on "large" requirements for remissions (more than 15 millicuries per remission).

Durations of successful remissions lasted from one to two years in the majority of cases (50.4%). In 31.6% the remissions lasted two to four years. Duration of single remissions of more than four years was seen in 4.5%. In some cases in which remissions were otherwise successful, occasional remissions (13.5%) of less than one year were obtained.

TABLE 4.—*Hematologic Complications in Patients Who Received Radiophosphorus Therapy for Polycythemia*

Disease	No.	Percentage of 148 Patients
Acute leukemia	4	2.7
Chronic myelocytic leukemia	1	0.7
Anemia with leukemoid reactions	7	4.7
"Aplastic anemia"	1	0.7
	13	8.8

Major hematologic complications were seen in 13 patients as shown in table 4. The four patients who died of acute leukemia were all men, 49, 61, 63, and 67 years old, respectively. In these patients, the leukemia was a fulminating acute type without a preceding period of chronic myelocytic leukemia. None of the patients received more than 14.0 millicuries of radiophosphorus, and one of the patients had obtained a remission of one and a half years after a single injection of 7.0 millicuries.

Another patient was maintained in successful annual remissions for four years with doses of radiophosphorus varying between 4.9 and 7.0 millicuries per course. The other patients did not have successful remissions.

By no set of criteria could one predict that any one of these patients was potentially leukemic. In one patient there was a palpable spleen but neither leukemoid reaction nor hyperuricemia. Another had a palpable spleen, hyperuricemia, and high total blood volume but did not show a leukemoid reaction before treatment. The other two patients exhibited palpable spleens and leukemoid reactions.

The patient who died of chronic myelocytic leukemia was a man aged 51 years. At the time of first admission he exhibited pronounced splenomegaly and leukemoid reaction with high leukocytosis in addition to his polycythemia. He was under observation and treatment for six years, during which time he was given a total dosage of 76 millicuries in multiple injections, but he never obtained a satisfactory objective remission although he was somewhat improved symptomatically. His blood picture eventually became that of a chronic myelocytic leukemia with anemia.

Under "hematologic complications" we have listed the category "anemia with leukemoid reactions," since this best summarizes our knowledge of them. In only one of these patients has it been possible to do a bone marrow study, and in this case, multiple punctures have failed to yield marrow material suggestive of myelofibrosis and myeloid metaplasia. In this group of cases there were four women aged 48, 58, 68, and 71 years and three men aged 51, 63, and 67 years. Four of these patients had leukemoid reactions with their polycythemia before treatment, and three of these also had hyperuricemia. Another patient had splenomegaly and hyperuricemia but no leukemoid reaction before treatment. The remaining two patients had splenomegaly and elevation of the total blood volume but neither hyperuricemia nor leukemoid reaction. These patients have been under observation three to seven years. One patient was reported to have died of aplastic anemia, and another died of cerebral hemorrhage. The other five were still alive at the time of last report.

Hypoplastic anemia was noted in four patients after treatment. Only one of these patients needed transfusions because of the anemia. In this case, the anemia occurred after a single injection of 5.0 millicuries. The anemia lasted four months. Since that time, the polycythemia has recurred, and the patient has received further radiophosphorus therapy without event. In the other three patients, the anemia was mild and required no treatment. All these patients are included under the "successfully treated" group.

There have been 22 deaths in 148 cases. The contrast between the causes of death in table 5 and those of 32 patients not treated with radiophosphorus (table 1) is striking although the two groups are not altogether comparable, since the duration is generally greater for the group not treated with radiophosphorus. In the group not treated with radiophosphorus, the chronic leukemias tended to appear in the second decade, whereas all the deaths in the radiophosphorus-treated series have been actually observed only within the first decade.

The percentages of deaths due to vascular accidents are more comparable, as deaths from these tend to occur within the first decade. In the group treated by other means, 56.3% of the deaths were due to vascular accidents, whereas in the radiophosphorus-treated group, the incidence of death from vascular causes was 4.7%, less than one tenth of the incidence in the other group.

The review of vascular accidents in posttreatment cases shows, in addition to the seven patients who died, one patient who sustained a coronary thrombosis and is still alive. Five of these patients had had previous vascular accidents before treatment. In response to radiophosphorus therapy, only one had obtained a satisfactory remission. The other seven had failed to respond to treatment adequately.

It is worthy of note that two women in the radiophosphorus series were successfully treated for primary polycythemia and subsequently became pregnant. In both instances, no untoward events occurred during the pregnancies, and the infants born of these mothers were apparently normal. One patient, aged 25 years, had had symptoms of and treatment for polycythemia for nine years prior to examination and treatment with radiophosphorus at the clinic. She received two courses of radiophosphorus: one of 10 millicuries, the other of 6.4 millicuries. The pregnancy followed the last administration of radiophosphorus by several months, and the patient has continued in remission for more than two years. The other patient, aged 30 years, had had symptoms of six years' duration. She had splenomegaly, leukemoid reaction, hyperuricemia, and excessive total blood volume. Her condition was easily controlled on two separate occasions (two courses). A single injection of 5.7 millicuries was used in one course, a single injection of 4.9 millicuries in the other. The last remission has lasted more than two years, and it was in this remission that her pregnancy occurred.

TABLE 5.—*Causes of Death of 22 Patients with Primary Polycythemia Treated with Radiophosphorus*

Cause of Death	No.	Percentage of 148 Cases	
Acute leukemia	4	2.7	
Chronic myelocytic leukemia	1	0.7	
Aplastic anemia	1	0.7	
Congestive heart failure	2	1.4	
Coronary thrombosis	3	2.0	4.7
Cerebrovascular accidents	4	2.7	
Malignant tumors	3	2.0	
Pneumonia	1	0.7	
Postoperative hemorrhage	1	0.7	
Unknown	2	1.4	
	22	15.0	

COMPARISON OF PRETREATMENT DATA AND RESPONSE TO RADIOPHOSPHORUS

The analysis of pretreatment data given in table 6 and 6 A has been made to see if response to treatment could be predicted. It is evident from these tables that there is no absolute or exclusive criterion or combination of criteria on which success, degree of success, eventuality of hematologic complication, or failure may be absolutely predicted. However, certain tendencies are apparent.

First of all, among the four major categories of response (success, success with hematologic complications, failure, and failure with hematologic complications), there is a very high incidence of success (90.5%) in those cases of primary polycythemia in which only the basic criteria are present. Furthermore, in this group, no patients were seen with hematologic complications. In this group, devoid of what is usually considered to be indication of panmyelopathy, there were nearly 10% (9.5%) failures. The data suggest that the presence of the other criteria materially reduces the incidence of success, although the percentage of successful response is still high. Features such as splenomegaly, hypervolemia, history of vascular complications, and history of previous treatment do not seem to change the expectancy significantly from that of the entire series (75.7%).

When a leukemoid reaction is present, there is a somewhat lower incidence (65.9%), and when there is a marked leukemoid reaction, only 28.6% are treated successfully, although the number involved here was small, but it is noteworthy that even with this indication of pronounced myelopathy two patients have been successfully treated.

Those cases with hyperuricemia exhibited some further reduction in incidence of good result, as only 54.6% (18 patients) of the patients were successfully treated, 12% (four patients) had hematologic complications, and 33.3% (11 patients) had failures.

The group characterized by splenomegaly and leukemoid reaction had a lower incidence of success (58.2%) than that of all cases showing splenomegaly (72.8%) or all cases exhibiting leukemoid reaction (65.9%).

TABLE 6.—*Primary Polycythemia: Type of Response to Radiophosphorus Therapy Compared with Pretreatment Features*

Type of Response	Cases	Basic Criteria Only		Leukemoid Reaction		Splenomegaly		Hyperuricemia		Total Blood Volume More Than 110 Cc./Kg.		All Foregoing Criteria	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Successfully treated: 7.0 mc. or less per remission....	47	11	52.4	9	20.5	28	28.3	6	18.2	23	33.8	1	14.3
Successfully treated: Initial remission required more than 7.0 mc., then 7.0 mc. or less thereafter........	16	2	9.5	3	6.8	12	12.1	2	6.0	9	13.2	..	....
Successfully treated: 7-15 mc. per remission..........	*38*	*5*	*23.8*	*11*	*25.0*	*25*	*25.3*	*5*	*15.2*	*11*	*16.2*	*1*	*14.3*
Successfully treated: More than 15 mc. per remission	11	1	4.8	6	13.6	7	7.1	5	15.2	8	11.8	1	14.3
Successfully treated but hematologic complications..	7	..	....	2	4.5	6	6.0	4	12.1	5	7.3	1	14.3
Failure	24	2	9.5	10	22.8	16	16.2	9	27.3	8	11.8	2	28.5
Failure plus hematologic complications..............	5	..	....	3	6.8	5	5.0	2	6.0	4	5.9	1	14.3
	148	21	100.0	44	100.0	99	100.0	33	100.0	68	100.0	7	100.0

TABLE 6 *A.—Primary Polycythemia: Type of Response to Radiophosphorus Therapy Compared with Pretreatment Features*

Type of Response	Cases	Duration More Than 5 Yr.		Vascular Complication		Previous Treatment		Pronounced Leukemoid Reaction		Leukemoid + Splenomegaly		Leukemoid + Splenomegaly + Hyperuricemia		Hyperuricemia + Splenomegaly	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Successfully treated: 7.0 mc. or less per remission.........................	47	12	26.0	8	17.4	14	19.4	..	....	7	19.4	2	11.8	1	14.3
Successfully treated: Initial remission required more than 7.0 mc., then 7.0 mc. or less thereafter............	16	6	13.0	7	15.2	8	11.1	2	28.6	2	5.6	..	....	1	14.3
Successfully treated: 7-15 mc. per remission	38	5	10.9	15	32.7	19	26.4	..	....	7	19.4	2	11.8	2	28.6
Successfully treated: More than 15 mc. per remission.........................	11	8	17.4	4	8.7	8	11.1	..	....	5	13.8	3	17.6	1	14.3
Successfully treated but hematologic complications	7	1	2.2	3	6.5	4	5.7	..	....	2	5.6	2	11.8	..	....
Failure	24	13	28.3	7	15.2	14	19.4	3	42.8	11	30.6	6	35.2	2	28.6
Failure plus hematologic complications	5	1	2.2	2	4.3	5	6.9	2	28.6	2	5.6	2	11.8	..	....
	148	46	100.0	46	100.0	72	100.0	7	100.0	36	100.0	17	100.0	7	100.0

When the group characterized by leukemoid reaction, splenomegaly, and hyperuricemia is considered, though the number considered is relatively small (17 cases), there seems to be a further reduction of incidence of success (41.2%).

Furthermore the incidence of hematologic complications seems to be greater in the group showing marked leukemoid reactions and hyperuricemia.

Cases of more than five years' duration show an incidence (67.3%) of successful results somewhat lower than those of the general series. The percentage of failure is higher, but the incidence of hematologic complications is not increased.

When only cases with successful response are studied and subdivided as to type of radiophosphorus course needed to induce remissions, we again note a relative tendency for the cases with basic criteria alone to require less radiophosphorus per course than others. Obversely, a higher proportion of those with leukemoid reactions, hyperuricemia and with the combinations of splenomegaly and leukemoid reaction, and of splenomegaly, leukemoid reaction, and hyperuricemia falls into the group that requires more radiophosphorus per course.

CONCLUSIONS

A study of 199 patients with primary polycythemia prior to radiophosphorus therapy reveals several "general" types: (1) a type characterized by increased erythrocyte volume in the presence of normal or increased total blood volume; (2) a type characterized by polycythemia plus evidence of panmyelopathy; (3) either the first or second type plus a history of vascular accidents.

The occurrence of vascular accidents shows no particular predilection for either the first or second type. Vascular accidents occurred in approximately one third of the cases before radiophosphorus treatment. The relation of leukemoid reaction to duration suggests that panmyelopathy is commoner with long duration.

A study of data on 32 patients with primary polycythemia treated with means other than radiophosphorus and the cause of whose death is known shows a very high incidence (56.3%) of death from vascular accidents, which tended to occur within the first decade. Leukemia accounted for 12.5% of the deaths, and these tended to occur later than the deaths from vascular accidents, although the incidence of leukemia occurring earlier may have been masked by the high mortality from vascular accidents.

Adequate posttreatment information was available on 148 of the original 199 patients. In the posttreatment group so far, there has been a decided reduction in the incidence of vascular accidents. Because of the factors mentioned previously, any comparison of the incidence of leukemia in the group treated with radiophosphorus and in groups treated with other methods is premature, since radiophosphorus has been used for a single decade or less. In the radiophosphorus-treated group, leukemia has occurred in approximately 3% of the group. Other hematologic complications bring the total for this type of event to 8%. In our opinion, this is a small risk compared with the much greater risk of vascular accidents (30% incidence in the pretreatment group as against 56.3% in the group in which the causes of death were known).

Radiophosphorus therapy is successful in producing remissions of more than one year's duration in three quarters of the cases. Simple polycythemia was successfully treated in 90% of the cases. The occurrence of leukemoid reactions or hyperuricemia in types manifesting some degree of panmyelopathy involved some reduction of the incidence of success.

UNITED NATIONS MEDICAL SERVICE IN KOREAN CONFLICT

Major General Edgar Erskine Hume,
Chief Medical Officer, United Nations Forces in Korea

In offering a preliminary report on the medical activities of the United Nations Forces in Korea, I have at once an unusual privilege and a difficult task, difficult because for reasons of security I cannot quote actual statistics and because conclusions about a campaign still in progress are necessarily incomplete.

The conflict in Korea is an unusual one in many respects. Never before have fighting men of so many nations and races joined together in a campaign within a single area of comparable size. Korea is about the size of Italy, and its mountains, though more numerous and more irregular in configuration, are strikingly like the Apennines. Veterans of the Italian campaign of 1944-1945 are struck by the similarity. Climatically Korea is difficult, for it is very hot and dusty in summer and bitterly cold in winter. The Korean climate is the coldest in which American soldiers have ever fought, and of course the troops from Thailand, the Philippines, and Ethiopia have never experienced anything like the subzero temperatures common in the Korean uplands in winter. In the spring there are heavy rains, turning the dirt roads into morasses, with consequent difficulties in transportation of the personnel and matériel of war. The time factor has been a major one in this campaign, for the conflict began without warning. With no advance notice it was necessary for the United Nations to send medical units into Korea to support the troops thrown in to resist the invading force from North Korea. This was done by depleting medical installations in Japan. Happily, this has since been corrected by the advent of additional medical units and personnel.

The conflict now raging in Korea is only a police action, not a war. Yet to those of us who must care for men wounded in this action, there is but little difference.

To give an idea of the magnitude of the military effort in Korea, I shall compare it numerically with the eight major wars which the United States has waged in its century and three-quarters of existence as a nation. Similar comparisons with the wars fought by the other United Nations could be made, had I the records available.

During the first eight months of the Korean campaign the United States Army has sustained nearly five times as many casualties as there were in the American Revolution (1775-1783), nearly 11 times as many as we had in the War of 1812, not quite four times those of the Mexican War (1846-1848), and over six times as many as in the Spanish-American War (1898). Only the War Between the States (1861-1865) and the two world wars have cost us more lives. The statistics used are those reported in private publications quoting the Department of Defense.[1] But it is not really possible to compare the casualties of one war with those of another on a categorical basis because of different classifications used. During the Revolution and War of 1812 the record did not differentiate between deaths in battle and those from disease. In later wars such separation was made, but it was not until World War II that the number of men who perished as a result of the enemy was greater than the number of men who died from disease. In the Mexican War seven men died of disease for every one killed by

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[1] These data are based on unofficial statistics published weekly in *Time* magazine and in the "1950 Information Please Almanac." Both sources state that the material is from the Department of Defense, but the author is without official confirmation. No Korean conflict statistics as maintained in the Far East Command are used, these not being yet ready for release.

the enemy. And the War Between the States saw, on both sides, more than twice as many men mortally stricken by disease as were killed in battle or died of wounds. The brief war with Spain resulted in comparatively few battle losses, but more than 12 times that number died as disease victims. In World War I there were more deaths from disease, but the excess over battle deaths was not great. Then came our most costly war, World War II, wherein the age-old ratio was reversed and there were nearly 16 times as many deaths directly caused by the enemy as from disease. This great change was due not to increased lethal power of the enemy's weapons but to the magnificent strides made by military preventive medicine.

Let us consider some of the diseases which have through the ages been the most deadly killers of fighting men. Take, for instance, two which, though somewhat similar in name, are in no way related. One, typhoid, or enteric fever, is a warm-weather intestinal disease spread by contamination of food or drink. The other, typhus, is essentially a winter disease, transmitted in its epidemic form by the bite of an infected louse.

These two maladies have destroyed more soldiers in past wars than all the piercing or cutting weapons, firearms, and chemicals of armies in the field. No one charged with the duty of keeping the soldier fit to fight—which is the ultimate function of a military medical service—can properly perform his mission if he fails to recall what these two scourges have done to soldiers in the wars of which we have records.

Typhus, sometimes known as prison or jail fever, has accompanied man's misery from time immemorial, never more so than in war. We believe that Napoleon's failure in his invasion of Russia was due less to the "scorched earth" policy of the Russians than to the terrible outbreak of typhus. This fearfully fatal disease confers immunity on those who survive. And the Russians seem to have become protected against attacks of typhus by having earlier had that malady, perhaps in mild form. But the men of the Little Corporal's Grande Armée had not had typhus and fell victims to its ravages. The terrible winter retreat from Moscow followed, as every schoolboy knows. I have myself seen typhus at short range, first in the destructive epidemic in Serbia and other Balkan States during and after World War I, when dichlorodiphenyltrichloroethane (DDT) was unknown and we had to depend on steam sterilizers to destroy the infected lice. Secondly, I witnessed the epidemic in Naples in 1943-1944. By then we had DDT powder and with it disinfested masses of Neapolitan humanity to such effect that the epidemic was actually stopped and not one Allied soldier got the disease. So I have cause to fear typhus.

With these lessons in mind we have fought typhus in Korea and have managed to ward off epidemic incidence among United Nations personnel. But the enemy—and we know this from many sources, including statements made by prisoners-of-war—has not escaped. His troops have had epidemic typhus. One of our best medical authorities feels that, despite the appalling casualties inflicted by United Nations forces, there have been still more enemy fighting men destroyed or disabled by typhus.

The other major disease which has mowed down soldiers heretofore is typhoid. In past wars our soldiers have known it to their cost. Even though such misleading and meaningless terms as "typhomalaria," "bilious remittent fever," and the like have been used to hide the dreaded term "typhoid," yet prior to the end of the 19th century this malady alone was admittedly a more potent killer than enemy weapons.

America's first clear record of this disease in war was in our three-month campaign with Spain in 1898. The enemy killed few, indeed, of our troops. But "General Typhoid" struck them down with relentless efficiency. They died in camp, in transport, and in the field. It was at this juncture that Major Walter Reed and his co-workers showed how typhoid is transmitted from the sick to the well man, a splendid piece of scientific observation not to be confused with his yellow-fever studies. In the Spanish-American War thousands of our soldiers contracted this disease, and of the total number who died from disease, about one-half died of typhoid. In a few years there followed the immunization of our army against typhoid, and with that procedure we have reduced this disease to one no longer of prime military importance.

A few general statements will show what has happened to typhoid as a menace to our army. In World War I we had only 1,529 cases of this disease; but by standards of the Spanish-American War we should have had half a million. In World War II we had about 627 cases, but the expected number on the basis of the Spanish-American War rates would have been two million cases. And two million soldiers could turn the tide in even the largest war. But when we come to the conflict in Korea, where our men have had to live and fight in intimate contact with infectious material in rice paddies and in the soil on which their tents are pitched or in which their foxholes are dug, a greater danger from typhoid than ever arose. Yet we have not had half a dozen cases of typhoid fever among our troops in Korea. Probably never before in the history of wars has this been true. Strong words these, but true ones!

No better measure can be found as to the effectiveness of United Nations' preventive medical measures in Korea than to compare the epidemic and other disease conditions on our side with those on the enemy's side. We have found prisoners-of-war suffering from leprosy, tetanus (more than 200 cases), and other maladies which have been unknown among United Nations personnel. Smallpox in epidemic proportions has accounted for many enemy noneffectives and deaths, while with us constant watchfulness and hard work have saved United Nations forces from this menace. Intestinal parasites are so plentiful among prisoners-of-war in Korea that they are a factor in operative care of gunshot and other wounds of the alimentary tract. Among the general population or where protection against mosquitoes is inadequate, malarial incidence is very high. Yet chloroquine has been highly satisfactory (far more so than quinacrine [atabrine]) in its antimalarial protective and curative effects.

Certain maladies associated with the present war are being studied in special institutions and by special groups. Among such research units are those concerned with the treatment of burns, cold injuries, hepatitis, the dysentery group of diseases, malaria, and others. Such biological products as streptomycin, chloramphenicol (chloromycetin®), aureomycin, terramycin, corticotrophin (ACTH), and cortisone are among those being studied clinically. Neuropsychiatric patients are being considered in a somewhat new light.

One of the few good features of this campaign is the opportunity for medical research. Studies which in times of peace would require years may be completed in a matter of months, such being the tempo of the conflict. Much is quickly learned in clinical practice, also, in the fierce light of battle. All this is of great importance to youthful physicians drawn into the military service from peacetime professional pursuits of civil life. They have a wealth of clinical material and unrivaled opportunity to learn, and so when they return to their hospitals and other functions at home they will find themselves better qualified. This has been the subject of favorable comment by all the distinguished civilian consultants who come to Japan and Korea at the behest of the Surgeon General. One is reminded of the words of Hippocrates himself, "He who would become a surgeon should join the army and follow it."

It is hard to adjudge the effectiveness and efficiency of our military medicine and surgery other than by counting the number of fighting men who die in our hospitals. Obviously, wounded who perish before reaching a medical installation have never been patients and so are not included in medical statistics.

On the basis of the experience of World War II, we expected that 4.5% of all wounded who reached our military hospitals would die. But this calculation was incorrect. The death rate among battle casualities treated in our hospitals has actually been about half this. A proud figure indeed! In other words, thus far, of every 1,000 wounded men admitted to our hospitals 975 live. Municipal hospitals in large cities, those that care for the victims of ordinary accidents due to traffic, industry, and the like, can hardly match these figures.We hope that, with help of Providence, we can maintain this goodly record to the end of the conflict.

The problems incident to administering a medical service to soldiers, sailors, and airmen of more than a score of United Nations in Korea are exceedingly difficult. Methods and customs vary, racial susceptibility to disease is a factor. Diets, language, and religions are different. But all men of the United Nations forces are united in a common ideal, and have a will to fit into a composite force fighting for freedom of mankind. Few of the contingents from various countries have other than a small medical group for primary front-line medical care of their men. The number of their medical officers, nurses, and men is limited indeed. Consequently, the whole task of immunization, transportation, hospital care, supply, evacuation, etc., of all patients devolves largely upon the United States Army. Such care is extended to naval and air personnel as well.

One must see the smoothness with which this united medical service functions to believe it possible. We make no distinction in our hospitals as to the nationality, race, rank, or religion of our patients. They are separated solely on the basis of their clinical condition. Not once has there been any difficulty or complaint regarding this policy. No physician, civil or military, can be other than satisfied to see a general in the bed next to a private, a Frenchman beside a Filipino, or a Negro in a bed adjoining that of a man of some other race. We hold that nowhere is the spirit animating the United Nations more manifest. When requested, we provide special food for those whose dietary rules or national usage specifies a particular diet. And even this has caused us but small difficulty.

Never since the period of the Crusades have soldiers of so many nations been united in one great cause, and we may claim even more, for among the United Nations warring against a common foe we have descendants of races which in the Crusades of old fought on both sides. Our hospitals are places of good cheer, and men who have sealed their brotherhood by their very blood understand each other in a lasting way. We believe that the future strength of the United Nations will be the better for this.

The manner in which our blood bank functions is a splendid example of the good consequences of good cooperation. While we regularly receive the bulk of our blood stocks by airplane from the United States, all and sundry people in Tokyo and other Japanese centers contribute their blood generously. Donors come from every category of people, soldiers, sailors, and airmen whose duties do not take them to Korea, civilian women as well as men, and personnel of every diplomatic mission in Japan. Japanese people have given freely, coming from every walk of life from the brother of the Emperor to poor laborers. In a literal sense, our fighting men are united by ties of blood. The American Red Cross has effectively attended to much of the administrative detail in all this.

There have been many military medical advances growing out of our experience in Korea. We have found that the helicopter is a wondrous saver of lives. These aircraft are attached to Mobile Army Surgical Hospitals, our most forward hospital units, in which women nurses are on duty. Upon call from the aid stations in the area of actual combat, the helicopter is sent forthwith to bring back the wounded man. Thus, in a matter of minutes rather than hours the patient is brought into a hospital where he may receive operative care. I have repeatedly decorated men in a hospital within one hour from the moment they were wounded.

Other air evacuation methods have likewise been developed to a new high point of efficiency. Small airplanes transport patients to airfields where they can be placed upon larger craft. Agonizing rides over the terrible roads, cut to pieces by artillery and by heavy use, are thereby largely avoided, though there are tactical situations when no other transportation can be employed. We use large motor ambulances, accommodating a dozen or more patients. Some of these ambulances have auxiliary metal wheels which can be lowered so that the vehicle may run on railway tracks. We have splendidly equipped hospital trains with every modern facility that carry patients from point to point in Korea where such mode of travel is indicated. Our railway hospital cars have steel walls and bullet-proof glass, two necessary and practical features, for on many night journeys guerillas fire on the trains. Indeed, though we have not removed the Red Cross from our trains and ambulances, we have painted out the white background thereof. It too often served as a target, for the enemy does not respect the Red Cross and is not even a party to the Geneva Convention.

Never before has there been a war in which the wounded could be so speedily and effectively removed from the embattled country and taken to a land not at war. We do just that. The Air Force, and to a less extent the Navy, transport patients to Japan in a matter of a few hours. In the latter country we have facilities for separating them according to the nature of their wounds or maladies. Triage is effected en route.

There is not space, nor is it otherwise appropriate at this time, to describe the system in effect for supplying all our units with needed medical apparatus and stores. Nor can I include details as to our highly effective Dental Corps, whose officers not only render care to the patients' teeth but do splendid work in maxillofacial surgery. Our Veterinary Corps is charged with inspection and supervision of foods, not solely those of animal origin, as formerly. We have two women's corps. In addition to the Nurse Corps there is the Women's Specialist Corps, composed of dietitians, physical therapists, and occupational therapists. Besides these, members of the Women's Army Corps (WAC's), though not medically trained, are often assigned to aid our nurses in military hospitals, frequently as volunteers when their ordinary daily tasks have been finished. Some of the other United Nations have sent women to participate in this great united medical effort. Thus in our hospitals one sees nurses from France, the Philippines, Belgium, Greece, Thailand, Netherlands, Turkey, the British Commonwealth of Nations, and others working together. Language is no barrier. In our Swedish and Norwegian hospitals and aboard our Danish hospital ship, in our Indian field ambulance, and in our British Commonwealth installations, patients from each United Nation are received. And the system works beautifully.

We have many thousands of wounded and ill prisoners-of-war. In care of them we have scrupulously lived up to every word of the Geneva Convention. Swiss officers, representatives of the International Red Cross, have been most kind in their reports on our treatment of captured enemy personnel. They have told us that the enemy has refused them permission even to enter northern Korea, much less to visit prisoners-of-war. Enemy physicians and nurses serve beside those of the United Nations in our hospitals, an example of the ability of medical personnel to work together under every condition. A separate medical organization is charged with professional care of the many thousands of refugees who wander the roads and fill the cities of war-torn Korea. Medical service for these unfortunate men, women, and children forms no part of my present report.

The Korean conflict has been carried on for nine months as these lines are written. Obviously it is too soon to give statistics, nor would it be proper to do so while we are still fighting, for we must not divulge data that might help the enemy. Yet what I have written will give an idea of what has been and is being done.

When the campaign is over we can then report, in detail, the gallant conduct of our medical personnel under fire. Many have been killed; many, decorated for heroism. A story remains to be told that will make us all proud of our calling.

PANHYSTERECTOMY IN THE TREATMENT OF CARCINOMA OF THE UTERINE CERVIX

EVALUATION OF RESULTS

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In every hospital increasing numbers of intraepidermal[1] and early[2] invasive carcinomas of the uterine cervix are being discovered through awakened popular interest and the various new diagnostic methods. Simultaneously the surgical treatment of carcinoma of the cervix is being reevaluated by Meigs, Morton and others. It is becoming apparent that surgical treatment of early cases may offer improvement in cure rates over irradiation therapy, but the extent of surgery required for a given case is debatable.

It has been suggested that ordinary panhysterectomy might be as effective as the more radical Wertheim operation with pelvic lymph node resection, on the theory that if the tumor is confined to the cervix it will be cured by panhysterectomy alone; if it has extended beyond the cervix, the radical operation will not effect a cure. The purpose of this paper is to determine, if possible, what results are obtained when patients with early carcinoma of the cervix are treated with ordinary panhysterectomy.

Unfortunately, the small numbers of early cases that have been recognized in the past have permitted little experience with this treatment. In 1943 Jones and Jones[3] reported 36 cases of early carcinoma of the cervix treated at the Kelly Clinic with panhysterectomy. All of these cases were clinical stage I with a malignant ulceration of less than 1 cm. in diameter (Schmitz I). They showed an absolute five-year cure rate of 41.6%. This did not compare favorably with the five-year cure rate of 57.5% for a wider group of League of Nations stage I lesions treated with irradiation at the same clinic. They concluded that panhysterectomy is not a satisfactory therapy for carcinoma of the cervix.

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[1] In this clinic the terms "intraepidermal carcinoma" and "carcinoma *in situ*" are used to include lesions which extend into gland spaces but have not broken through the basement membrane.

[2] "Early" is used throughout this paper to indicate slight or limited invasion rather than with reference to the duration of the lesion.

[3] Jones, H. W., and Jones, G. E. S.: Panhysterectomy Versus Irradiation of Early Cancer of the Uterine Cervix, J. A. M. A. **122:** 930 (July) 1943.

Sanders and Christensen[4] report that 17 patients with early stage I carcinoma of the cervix were treated with panhysterectomy alone at Henry Ford Hospital and a five-year cure rate of 82.2% was obtained, as compared with 66.6% in a somewhat similar group of 18 patients treated with irradiation alone.

TeLinde[5] believes that certain "extremely early" carcinomas can be treated successfully by wide panhysterectomy, consisting of generous excision of the parametrium and vagina, but without lymph node resection. In substantiating this he points out that Bonney,[6] employing radical panhysterectomy with lymph node resection, obtained a cure rate of only 5.5% higher than did Peham and Amreich[7] using only wide vaginal hysterectomy. Recently Galvin and TeLinde[8] have advocated wide panhysterectomy only for intraepidermal carcinomas, which they believe deserve a classification separate from stage I.

MATERIAL

The 36 patients presented here comprise two groups: One of 23 patients, treated between 1929 and 1944, for which five-year results have been investigated; and an additional group of 13 patients, treated between 1944 and 1947, for which three-year results have been gathered. These patients represent all who had a panhysterectomy with a concurrent diagnosis of carcinoma of the cervix during the time intervals covered. Adequate follow-up information was obtained for all patients. Of the 36 cases, there were 15 in which diagnosis of carcinoma was established prior to operation and surgery was the treatment of choice. In 18 cases carcinoma was not suspected; hysterectomy was performed for some other cause, and the diagnosis was made on pathological examination of the excised specimen. In three cases carcinoma was suspected but not confirmed prior to operation. The number of patients who received surgical treatment inadvertently is indicative of the incipient stage of most of the lesions in this series. It is reasonable to assume that such a group would offer the best available prognosis for surgical treatment.

Classification.—All the recognized lesions were classified as early stage I (League of Nations) prior to operation. Among the 18 patients without previous diagnoses, eight were found in whom no gross cervical lesion of any kind was seen. This was determined by a careful review of the physical examinations, operative notes, and pathological reports. In eight others a nonspecific lesion, usually described as an erosion, was present but did not excite in the examiner a suspicion of carcinoma. In two others there was gross carcinoma which should have been recognized clinically and these must be considered missed diagnoses.

It is interesting to note that the absence of a gross lesion did not necessarily indicate lack of invasion. Of the eight patients with no gross lesion, three showed definite invasion when examined microscopically and only the remaining five had intraepidermal invasion. This disparity between gross and microscopic appearances cannot be emphasized too often.

Type of Surgery.—With the following exceptions, all the operations were ordinary abdominal panhysterectomies: Two were vaginal hysterectomies in elderly women with prolapse; three were wide panhysterectomies with greater than average portions of parametrium and vagina excised. The latter, of course, were among those diagnosed prior to operation.

Cell Type.—Among the 36 cancers were four adenocarcinomas of the cervix, one of which was noninvasive. The remainder were squamous cell carcinomas which were classified as follows: six, well-differentiated; seven, partially differentiated; nine, poorly differentiated. An additional 10 lesions were classified as intraepidermal carcinomas.

Follow-up.—Adequate follow-up information was obtained for all patients in this series: for staff patients, from the gynecological tumor clinic of University Hospitals; for private patients, from their personal physicians who furnished the clinic with recent information, or sent their patients in for examination. For deceased patients the presence or absence of carcinoma and the cause of death were ascertained by postmortem examination, or by unequivocal clinical findings.

RESULTS

Table 1 shows results in the two groups: one followed from five to 14 years, the other followed from three to five years. The five-year group showed a cure rate of 65.2%, which might be the cause of considerable optimism until the more moderate rate of 53.8% in the three-year group is observed. It is interesting to note (table 2) that the three-year group contains a higher proportion of noninvasive lesions and that a markedly greater proportion of patients received adjunctive x-ray therapy, yet the cure rate is lower. There is no easy explanation of this apparent paradox except that the groups are small and chance distribution can alter the results significantly.

TABLE 1.—*Results in Early Stage I Carcinomas Treated with Panhysterectomy*

Follow-Up	Cases	Dead of Carcinoma	Living, with Recurrence	Living and Well	Cure Rate, %
Five year	23	8	0	15 *	65.2
Three year	13	4	2	7	53,8
Total	36	12	2	22	61,1

* Two of these patients died of heart disease, 9 and 11 years after operation, free of carcinoma.

TABLE 2.—*Results According to Microscopic Extension and Supplementary Irradiation*

	Cases	Panhysterectomy Alone	Panhysterectomy and Irradiation	Alive and Well	Cure Rate, %
Five year follow-up					
Intraepidermal	4	4 (4)*	0 (0)*	4	100.0
Confined to cervix	15	11 (8)	4 (2)	10	66.6
Extension beyond cervix	4	0 (0)	4 (1)	1	25.0
Total	23	15 (12)	8 (3)	15	65.2
Three year follow-up					
Intraepidermal	7	3 (3)	4 (2)†	5	71.1
Confined to cervix	4	0 (0)	4 (2)	2	50.0
Extension beyond cervix	2	0 (0)	2 (0)	0	0.0
Total	13	3 (3)	10 (4)	7	53.8

* Numbers in parentheses represent survivals in the group indicated.
† See "Comment" for explanation of these recurrences.

It is not expected that the three-year group will show a significantly lower cure rate when these patients have been followed for five years, for all of the recurrences in the five-year group appeared within three and one-half years following treatment. In fact, the average interval between treatment and recurrence was only 17 months. Probably a more accurate estimate of the five-year cure rate for the entire series would be about 60 per cent or slightly less.

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[4] Sanders, J., and Christensen, R.: Personal communication to the author.

[5] TeLinde, R. W.: Operative Gynecology, Philadelphia, J. B. Lippincott Company, 1946, chap. 19.

[6] Bonney, V.: The Results of 500 Cases of Wertheim's Operation for Carcinoma of the Cervix, J. Obst. & Gynec. Brit. Emp. 48: 421 (Aug.) 1941.

[7] Peham, H. V., and Amreich, J.: Operative Gynecology, Philadelphia, J. B. Lippincott Company, 1934.

[8] Galvin, G. A., and TeLinde, R. W.: The Present-Day Status of Non-Invasive Cervical Carcinoma, Am. J. Obst. & Gynec. 57: 15 (Jan.) 1949.

Table 3 shows the results, previously reported by Dr. L. A. Pomeroy,[9] in 720 patients treated with radium and x-ray irradiation between 1919 and 1940. The results in all clinical stages are given to show the distribution.

COMMENT

Table 4 shows a comparison of five-year cures obtained at University Hospitals when early stage I carcinomas were treated with panhysterectomy (in some cases followed by irradiation) and by irradiation alone. Also shown are a similar series reported by Jones and Jones,[3] and the irradiation results from 24 hospitals in eight countries contained in the League of Nations report.[10] Although there appears to be a slight statistical advantage in favor of the panhysterectomy group, several considerations must be borne in mind: 1. The surgically-treated group contains significantly earlier cases since they were judged to be either early stage I or were so early that the patients were not thought to have carcinoma prior to operation. On the other hand, the cancers in the irradiated group were advanced sufficiently to be diagnosed clinically, and this group contained the full range of cases falling in the American College of Surgeons' clinical stage I. 2. When the present five-year group is enlarged to include the group in which three-year survivals are reported, a somewhat lower five-year cure rate will result. The maximum figure would be 61%; and it probably will be lower. This is no improvement over irradiation results obtained in this clinic.

Experience in this clinic, then, is consistent with that of Jones and Jones, although surgical results here are a little better. (Apparently the cases dealt with here were somewhat earlier, and none of the patients had to be assumed dead for lack of follow-up.) It seems doubtful that ordinary panhysterectomy is adequate treatment even for selected early carcinomas of the cervix. The wide panhysterectomy advocated by TeLinde might have produced a higher cure rate, but this is a matter of speculation.

Ordinary panhysterectomy may still have a role in the treatment of intraepidermal carcinoma. The obvious difficulty lies in establishing, prior to surgery, that a lesion is truly noninvasive. This difficulty is illustrated by two supposedly intraepidermal lesions in this series which were treated with surgery and recurred (table 2). Although both had been diagnosed as noninvasive by biopsy and by the original pathological examination of the excised specimens, when these sections were reviewed for the purpose of this study it was generally agreed that one of them was definitely invasive and the other was doubtful. If this error can be made when the entire uterus is available for examination, it is apparent that the problem is more acute with only biopsy material available prior to surgical treatment.

This is borne out by the fact that, in this series, biopsy prior to surgery was not a reliable indication of invasiveness as proved by survival. In 15 cases with biopsy prior to surgery which were studied, no better cure rate was obtained than among those with no preliminary biopsy.

TABLE 3.—*Results in 720 Patients Treated with Radium and X-Ray, 1919 to 1940*

	Cases	5-Year Cures	5-Year Cures, %
Stage I	44	28	63.6
Stage II	114	45	39.5
Stage III	451	104	23.1
Stage IV	111	2	1.8
Total	720	179	24.9

TABLE 4.—*Comparison of Five-Year Cures by Surgery and Irradiation*

	Cases	5-Year Cures	5-Year Cures, %
University Hospitals			
Panhysterectomy	23	15	65.2
Irradiation (L. A. Pomeroy)	44	28	63.6
Jones and Jones			
Panhysterectomy	36	15	41.6
Irradiation	87	50	57.5
League of Nations			
Irradiation (stage I only)	1,267	792	62.5

In conclusion, the findings in this clinic and those of Jones and Jones indicate that ordinary panhysterectomy is probably inadequate for early stage I carcinoma of the cervix. Although this operation should be effective for carcinoma *in situ,* every possible precaution should be taken prior to surgery to insure that the lesion is truly noninvasive. The wide panhysterectomy undoubtedly should be preferred for any early case if surgical treatment is to be undertaken.

SUMMARY

Thirty-six cases of early carcinoma of the uterine cervix treated with panhysterectomy, and in some cases with accompanying x-ray irradiation, have been presented. In 23 cases, observed postoperatively for five to 14 years, there was a five-year cure rate of 65.2%. In 13 cases followed from three to five years, 53.8% of the patients were alive and well at the end of the follow-up period.

These results do not compare favorably with those obtained by irradiation alone of a more advanced group of stage I carcinomas. The five-year cure rate by irradiation alone is 63.6%.

Ordinary panhesterectomy is probably not adequate treatment even for selected stage I carcinomas of the cervix. Wide panhysterectomy may offer better results.

200 Paramount Bldg. (6).

Hunger and Appetite.—Since these sensations are so frequently associated they tend to be confused in consciousness and it is often difficult to separate them clearly. The two are, however, essentially different, and appetite is not merely a less intense degree of hunger. The sensation of appetite may be experienced when the stomach contains plenty of food, and is therefore quite independent of hunger. On the other hand, though hunger is usually accompanied by keen appetite, this is not necessarily so. It is well known that the appetite may be lost though a feeling of emptiness and hunger be present. The two sensations also differ in that one (hunger) is unpleasant, while the other is pleasant.—Charles Herbert Best, M.D., and Norman Burke Taylor, M.D., *The Physiological Basis of Medical Practice,* Baltimore, The Williams & Wilkins Company, 1950, p. 604.

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9. Pomeroy, L. A.: Carcinoma of the Cervix Uteri: An Analysis of 790 Cases Treated over 5 Years Ago, Am. J. Roentgenol: **60**: 387 (Sept.) 1948.

10. Annual Report on the Results of Radiotherapy in Cancer of the Uterine Cervix, Stockholm, P. A. Norstedt & Söner, 1949, vol. 5.

CLINICAL NOTES

NEONATAL RUPTURE OF THE STOMACH

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and
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Although rupture of the stomach in a newborn infant is rare, it is a condition in which early diagnosis and prompt treatment can be lifesaving. In 1943 Herbut[1] found 15 cases in the literature and reported the 16th case, the first in which a congenital defect of the musculature of the stomach wall was described and considered responsible for the perforation. Pendergrass and Booth,[2] in 1946, reported an infant 3 days old with two perforations of the stomach. One of the perforations was closed surgically, but the other, on the posterior wall of the stomach, was not found until autopsy, after the infant died on the fifth day of life as a result of a fibropurulent peritonitis. According to the authors, the appearance at autopsy suggested that the "latter perforation was present at the time of operation and was overlooked due to its position and the fact that when one perforation was found and closed, an inadequate search was made for another perforation." In 1947 Burnett and Halpert[3] reported perforation of the stomach in a 2 day old Negro infant with atresia of the pyloric portion of the stomach. The principal predisposing factor in this case was believed to be a congenital defect of the muscle coats of the stomach. This case was of particular interest in that there was no distal obstruction in any of the previous 17 recorded instances of perforation of the stomach, while there was no perforation in the two previously reported cases of obstruction. In January, 1950, Tudor[4] reported the case of a white boy, dying on the fifth day of life, in whom postmortem examination revealed a perforation through the upper end of the greater curvature of the stomach. There was no mention of any muscular defect. This brought the total number of reported instances of rupture of the stomach in newborn infants to 19.

This report concerns two more cases, one in which the patient died and the other in which he recovered with surgical treatment.

REPORT OF CASES

Case 1.—E. M., a white boy, was born on Feb. 17, 1950, after a normal pregnancy and uncomplicated delivery by low forceps following saddle block anesthesia. His mother was a 22-year-old primipara said to have Raynaud's disease. The birth weight was 6 lb. 9 oz. (2,975 gm.). Physical examination findings on Feb. 19, 1950, when he weighed 6 lb. 3 oz. (2,810 gm.), were entirely normal. His weight rose to 6 lb. 8 oz. (2,950 gm.) on Feb. 20, when he was eating 2 to 2½ fl. oz. (60 to 75 cc.) of an evaporated milk and dextri-maltose® formula every four hours and passing about four normal yellow pasty stools a day. At 2 a.m. on Feb. 21, 1950, he took about 2 fl. oz. of formula and appeared to be in good condition. About 5:30 a.m. on the same day the nurse noticed that he suddenly had become cyanotic and that his abdomen was distended severely. She tried to insert a tube in the baby's rectum but was unsuccessful. She placed the baby in a premature incubator to administer oxygen. Physical examination at about 6 a.m. revealed a cyanotic infant appearing to be at the very point of death, with shallow irregular respirations and an abdomen distended so that it was tight as a drum. Attempts to insert a soft rubber catheter into the stomach through the esophagus were unsuccessful. Neither gas nor fluid could be aspirated. An x ray of the chest and abdomen revealed a large amount of gas in the peritoneal cavity, with the diaphragm pushed up high. When a 20-gage needle was inserted into the abdomen just to the left of the umbilicus, large amounts of gas came out under increased pressure. Although respiration improved after this procedure, the infant's condition remained very poor, in spite of supportive therapy. He died at 3:30 p.m. on the same day.

An autopsy was performed one and one-half hours after death. When the abdomen was opened, a small amount of gas with a foul odor escaped. The abdominal cavity contained about 100 cc. of cloudy brownish fluid. There were large amounts of clotted fibrinous exudate on the surface of the abdominal organs, with most of the exudate in the left upper quadrant. At the upper end of the greater curvature of the stomach there was a large perforation, about 4 cm. long. The borders of this opening were irregular, frayed, and dark blue. Along the middle of the lesser curvature of the stomach was a firm area about 1 by 2 cm. with a reddish surface. No other gross defects were observed in the abdominal or thoracic viscera.

The stomach was removed entirely, placed in formaldehyde solution U. S. P. and sent to Dr. Joseph Porter, pathologist at the Maine General Hospital, Portland, Me. His report stated that he had received in formaldehyde solution a stomach measuring 6 cm. in length. It was a grayish-white color; in the fundus along the greater curvature was a circular defect which measured 3 by 1.5 cm., with well-rounded fairly smooth edges. When the stomach was opened, there was a small amount of greenish material. The mucosa appeared normal, and there was no evidence of hemorrhage in the mucosa. The pyloric ring was patent and did not seem to be thickened. Sections were taken through this opening in the stomach and through the pylorus and mucosa.

On study, the margin of this perforation of the stomach showed a moderate degree of congestion of many of the vessels and an inflammatory infiltrate, which had extended beneath the mucosa and submucosa and also downward to just above the muscular layer. There were also foci of hemorrhage in the submucosa. The mucous membrane in all sections showed a fairly pronounced congestion, with several small hemorrhages present in the mucosa and occasionally in the submucosa. The vessels at the margin of, and for a short distance into, the adjacent stomach wall were congested markedly, and an occasional one was thrombosed. There was no evidence of tumor. It was the pathologist's impression that this was an antemortem perforation of the stomach, with necrosis of the wall, possibly due to intramural hemorrhage.

Case 2.—W. B., a white boy, the first of twins, was born at 2:40 a.m. on May 6, 1950, weighing 6 lb. 6 oz. (2,890 gm.). His mother was 40 years old, and this was her fourth pregnancy. Her first two pregnancies had resulted in miscarriages and the third, on April 18, 1948, in a normal girl. This pregnancy had been uncomplicated, except for the fact that the mother suffered a great deal of discomfort during her last trimester, presumably because of the large size of the uterus. W. B. was somewhat sluggish immediately after delivery but breathed spontaneously and appeared to be doing well within 15 to 20 min. His twin sister, who was born 25 min. after he was delivered, weighed 6 lb. 9 oz. (2,980 gm.). Her neonatal period was complicated from May 11 to May 13 inclusive by intermittent twitching of her extremities, usually involving only one side at a time. Physical examination findings were normal after the twitching had subsided, and she has had an uneventful course since then. She was not given any treatment except for vitamin K.

Physical examination of W. B. on May 8, 1950, when he had already regained his birth weight, resulted in normal findings,

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The nursing staff of Trull Hospital cared for the patients.

Dr. Kenneth J. Cuneo *administered* the anesthesia in case 2.

[1] Herbut, P. A.: Congenital Defect in the Musculature of Stomach with Rupture in Newborn Infant, Arch. Path. 36: 91-94 (July) 1943.

[2] Pendergrass, E. P., and Booth, R. E.: Report of Case of Ruptured Stomach in Infant 3 Days Old, Am. J. Roentgenol. 56: 590-593 (Nov.) 1946.

[3] Burnett, H. A., and Halpert, B.: Perforation of Stomach of Newborn Infant with Pyloric Atresia, Arch. Path. 44: 318-320 (Sept.) 1947.

[4] Tudor, R. B.: Peptic Ulcer in Infancy and Childhood, Minnesota Med. 33: *57-60 (Jan.) 1959.*

except for single transverse palmar creases. At 2 a.m. on May 9 he took 2½ fl. oz. of a formula of two-fifths evaporated milk and three-fifths boiled water, which he retained. At 5:30 a.m. he was observed to be cyanotic and to have a distended abdomen. About 10 min. later 3 to 4 cc. of a mixture of blood-stained mucus and material resembling coffeegrounds in appearance was aspirated from his oropharynx. He was given 4.8 mg. of menadione sodium bisulfite (hykinone®) intramuscularly, and x rays of his chest and abdomen were taken, both in the recumbent and in the standing positions. These revealed free air in the peritoneal cavity. A stomach gas bubble could not be discerned. Although this infant presented a picture similar to that seen in case 1, his condition did not appear to be as critical as the patient's in that case.

With the patient under drop ether anesthesia with oxygen at 7:30 a.m., the abdomen was opened through a right rectus incision. Air escaped under pressure when the peritoneum was opened, and there was some fluid in the cavity. On the greater curvature of the fundus of the stomach was an elliptical defect about 4 cm. long in the musculature of the stomach wall. The defect had V-shaped ends, as if the muscle layers had pulled away from the greater curvature. The only part of the stomach wall that seemed to remain in this defect was the mucosa, through which it seemed as if dark stomach contents were visible. This defect was closed by suturing together the edges of the muscle bundles. About 2 cm. above the pylorus, on the anterior surface of the stomach, a perforation about 1 cm. in diameter was found and closed. A catheter was inserted into the stomach through the nose before the stomach was closed. The patient stood the surgical procedure well.

Postoperatively he was given transfusions twice daily of citrated whole blood until he had a total of seven transfusions. Treatment also included oxygen and the administration parenterally of penicillin, sodium sulfadiazine, adrenal cortex extract, vitamin B and C, isotonic sodium chloride solution, 5% dextrose in water, and protein hydrolysate. On the day of operation his rectal temperature rose to 103.2 F., but it declined steadily until May 12, 1950, when it became normal and remained so. The patient was not fed anything by mouth until 8:30 p.m. on May 11, when small feedings of 5% dextrose in water were started every two hours. Two days later his feedings were changed to a dilute mixture of dryco® and dextri-maltose® in water, which was gradually increased in strength. The catheter which had been inserted in his stomach through his nose was removed on May 14, when he was started on oral administration of a multivitamin preparation. On May 28 a small superficial stitch abscess developed, which cleared up in three days with treatment with isotonic sodium chloride solution soaks. On June 1, when he weighed 6 lb. 13 oz. (3,100 gm.), his formula was changed to equal parts of evaporated milk and water, of which he took 3 fl. oz. (90 cc.) every three hours. Weighing 6 lb. 15 oz. (3,150 gm.) and in good condition, the patient was discharged home on June 5, 1950. When seen on June 16, 1950, he weighed 8 lb. (3,630 gm.) and was doing well. When examined on March 3, 1951, he was in excellent health.

SUMMARY

Two cases of rupture of the stomach in newborn infants, occurring approximately 85 and 75 hr. after birth, are reported. The second case is of special interest because the patient had a congenital defect in the musculature of his stomach and, as a careful search of the literature has not revealed any reports of survival from this condition, is believed to be the first one reported to have survived rupture of the stomach in the neonatal period.

ADDENDUM

Since this paper was submitted for publication, Wright and Scott[5] reported a case of perforated gastric ulcer in a newborn infant who died on the sixth day of life before operation could be performed.

372 Main St. (Dr. Ross).

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[5] Wright, L. T., and Scott, B. E.: Perforated Gastric Ulcer in a Newborn Infant, J. Pediat. 37:905-908 (Dec.) 1950.

ANAPHYLACTIC REACTIONS FROM LOCAL USE OF PENICILLIN

REPORT OF TWO CASES

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Four reports of anaphylactic reactions from penicillin have been found in the literature, in all of which the reactions were secondary to intramuscular injections.[1] The following cases are of interest because up to the time of writing there had been no report of similar reactions due to the local use or topical application of penicillin.

REPORT OF CASES

Case 1.—A white man, aged 57 years, in good general health except for moderate hypertension and recurring upper respiratory tract infections, was treated on Nov. 26, 1949 for subacute left maxillary sinusitis. The left antrum was irrigated through the natural ostium, and 1 cc. of mucopus was returned. The saline solution was displaced by air, and 30,000 units of crystalline penicillin G and 9.9 mg. of l-ephedrine in 4 cc. of 2.5 per cent "sulfisoxazole" (gantrisin®—3,4-dimethyl-5-sulfanilamido isoxazole) were instilled into the antrum. The patient had an almost immediate flushing of the face, choking, wheezing, dyspnea, and extreme circulatory depression with rapid, weak, almost imperceptible pulse, and profuse perspiration. This occurred with great suddenness while he was in the treatment chair, and before he could be got into the horizontal position, he lost consciousness. The reaction was one of immediate and alarming shock.

The patient was known to have hypertension, and as ephedrine had already been instilled into the sinus, epinephrine was not given. At the first onset of flushing of the face, 25 mg. of diphenhydramine hydrochloride and 100 mg. of aminophylline were given by mouth. When the circulation became so depressed, 0.5 gm. of caffeine and sodium benzoate was given hypodermically.

At the time a penicillin reaction had not been suspected because the patient had been entirely free from reactions when penicillin had been previously administered, which was as recently as five weeks. Up until this time, with considerable use of penicillin instilled locally into the sinuses, I[2] had had no patient with immediate penicillin reactions nor to my knowledge had any such reactions been reported in the literature.

The patient regained consciousness soon after being placed in a horizontal position. However, his general condition improved so slowly that it was about three hours before he recovered sufficiently to be removed to his home. There was no urticaria or skin rash. The next day, aside from being weak, he felt fairly normal.

The previous history had not indicated fungus infections, and the only discernible allergy suggested by the history was the presence on a few occasions of considerable sneezing and mucous discharge following treatment by a rhinologist. This was before the general use of penicillin, which therefore could not have been a factor.

Three months later, having received no treatment in the interim, while in another city on business and having an acute upper respiratory tract infection with about a 1 degree elevation of temperature, he called upon a physician and requested a "shot of penicillin." Receiving assurance from the patient that he had had no previous reactions from penicillin, the physician gave him 300,000 units of crystalline penicillin G procaine in peanut oil with 2 per cent aluminum monostearate, and, in the words of the physician, "within 15 minutes he had one of the severest manifestations of shock I have ever seen."[3] His blood pressure was 190/110 before the injection but immediately thereafter dropped to 90/60, the pulse became thready, and he broke out in a dripping perspiration. There was no precordial or radiating pain. He was put to bed in the office with warm blankets and external heat. Fifteen minims (1 cc.) of epinephrine hydrochloride was given very slowly hypodermically, and his blood pressure gradually rose to 150/90. Soon his condition improved, and after two hours in bed he felt quite normal again. There was no urticaria or skin lesions. The patient described the reaction as similar to the one in my office some months ago.

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[1] Cormia, F. E.; Jacobsen, L. Y., and Smith, E. L.: Reactions to Penicillin, Bull. U. S. Army M. Dept. 4:694, 1945. O'Donovan, W. J., and Klorfajn, I.: Sensitivity to Penicillin: Anaphylaxis and Desensitization, Lancet 2:444, 1946. Waldbott, G. L.: Anaphylactic Death from Penicillin, J. A. M. A. 139:526 (Feb. 19) 1949. Burleson, R. J.: Anaphylactoid Shock Due to Penicillin, ibid. 142:562 (Feb. 25) 1950.

[2] Everett, A. R.: Importance of Vasoconstriction in the Treatment of Acute and Chronic Maxillary Sinusitis, New York State J. Med. 49:417, 1949.

[3] Kaufman, H. M.: Personal communication to the author.

That sensitivity to penicillin had been induced in this patient, there can be no doubt. A review of his record shows his first contact with penicillin to have been in Feb., 1945, when 2,500 units of plain penicillin was instilled into the antrum. From then until November, 1949, he received 16 separate instillations of penicillin into the sinuses in doses ranging from 2,500 units to 40,000 units. In 1947 he received four intramuscular injections of plain penicillin of 100,000 units each, in 1948 two 300,000 unit injections of penicillin in oil and wax according to the Romanski formula and five injections of 300,000 units of crystalline penicillin G. All were entirely free from any side reactions or allergic manifestations. Only five weeks previous to his first reaction, 30,000 units of penicillin had been instilled into the antrum with no ill effects of any kind.

CASE 2.—A white man, 50 years of age, had emphysema and a chronic left maxillary sinusitis which became acute recurrently with each attack of coryza. Antrotomy had repeatedly been advised, but the patient steadfastly refused operation.

He was known to have asthma when in contact with horses and could not eat hard shell clams because of severe and immediate gastric symptoms. Once after oral ingestion of penicillin he had slight itching of the skin, which promptly disappeared after taking one or two 50 mg. tablets of tripelennamine hydrochloride. There was no history of any fungous infection.

On Feb. 8, 1950, because of a recent flare-up of the sinusitis, the sinus was irrigated, and 1 fluidrachm (4 cc.) of pus was returned. Thirty thousand units of penicillin and 9.9 mg. of l-ephedrine in 4 cc. of sterile water was instilled into the antrum through the natural ostium. Within a few seconds his entire skin became red and edematous, with intense itching, and severe asthma appeared. Fifty milligrams of tripelennamine hydrochloride was given by mouth and 0.5 cc. of epinephrine hydrochloride hypodermically which resulted in prompt relief. He was placed on a couch in the office, and after an hour all symptoms had disappeared and he felt quite normal. This patient had received frequent instillations of penicillin into the sinus from October, 1948, to February, 1950; he had also received over 3,000,000 units of crystalline penicillin procaine intramuscularly from November, 1947, to December, 1949, without any ill effects. Subsequent history, however, revealed that during the last three weeks of January he had used aerosol penicillin for the emphysema and at the end itching of the skin developed, which was promptly relieved by a few 50 mg. tablets of tripelennamine hydrochloride.

COMMENT

Long[4] has cautioned that repeated courses of penicillin therapy increase the possibility of producing an allergic state, especially its topical use on mucous membranes and abraided or weeping surfaces. It would appear likely that with the continued, extensive use of penicillin the number of cases of sensitivity will increase, and that in patients now receiving penicillin with no apparent side effects sudden and unexpected anaphylactic reactions may develop.

SUMMARY

Two cases of anaphylactic reactions from instillation of penicillin into the maxillary sinuses are reported and are probably the first due to local application. Both patients over a period of years had received penicillin therapy without ill effects and were probably sensitized by repeated exposure.

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[4] Long, Perrin H.: Symposium on Medical Therapeutics: Clinical Use of Antibiotics, M. Clin. North America 34: 307, 1950.

DIAPHRAGMATIC FLUTTER WITH SYMPTOMS RESEMBLING ANGINA PECTORIS

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One of the most fascinating medical cases concerns that of paroxysmal flutter of the diaphragm. From time to time accounts of the rare condition come to the attention of physicians who have observed an irascible individual who has made a livelihood of exhibiting his affliction in various institutions. The patient, Walter E. Urwiler, is 69 yr. of age, and, although he enlisted in the Army on two occasions, he is not entitled to care by the Veterans Administration because of desertion in both enlistments. Since 1935 six reports concerning his case have been published in medical journals. Recently, Federal charges against him were dismissed, and he was ordered released to the Army for disposition as a deserter.

In all instances of reported hospitalizations there have been evidences of psychopathy, malingering, belligerency, and procacity. Aliases are numerous and include the following: John J. Allen, Lewis Allen, Charles Blackwell, Charles Bennett, Frank Crawley, Timothy Dawson, George Drye, Joseph Mixen, James Rinhart, Robert Romford, Robert Keaton, and Joseph Zelly. His "occupations" have been given variously as prospector, trapper, hard-rock miner, deep-sea diver, bandit chaser and Texas sheriff, wealthy sheepman, and an officer in both the Army and the Navy. During more recent hospital tenures he has entertained fellow patients with his exploits as a drummer boy during the American Civil War and as a prisoner of the Japanese at Santo Tomas. He asserts that as a Regular Army officer he participated in assaults on Tarawa, Saipan, Iwo Jima, and Okinawa. He stated that the scars on his neck represented "stab wounds" inflicted during the Tarawa invasion. On another occasion he asserted that the scars were due to old operations for tuberculosis.

It is likely that the patient is now being treated at some hospital for symptoms resembling coronary occlusion, demanding narcotics and oxygen, and entertaining all with his many exploits. Accounts of his many stories and fabrications would be endless. It is the purpose of this report to give a summary of the case to date, commenting on the aspects of the diaphragmatic flutter.

From the Medical Service, Veterans Administration Hospital, Fort Logan, Colorado, and Medical Center, University of Colorado School of Medicine. Sponsored by the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions published by the author are a result of his own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

REPORT OF A CASE

Hospitalizations which have been listed in various reports are as follows: Colorado General Hospital, Denver, May, 1936; University of California Hospital, Berkeley, Calif., January 1937; Ventura County Hospital, Ventura, Calif., March, 1937; Oakland Regional Station Hospital, Oakland, Calif., September, 1944; Weimar Joint Sanitarium, Weimar, Calif., 1942; Dibble General Hospital, Calif., 1943; Veterans Administration Hospital, Livermore, Calif., 1943; Highlands-Alameda County Hospital, Oakland, Calif., 1944; Palo Alto Hospital, Palo Alto, Calif., August, 1946; Veterans Administration Hospital, Chamblee, Ga., June, 1948; Veterans Administration Hospital, Ft. Logan, Colo., November, 1948; Veterans Administration Hospital, Fayetteville, N. C., February, 1949; Fitzsimons General Hospital, Denver, December, 1949; Veterans Administration Hospital, Ft. Bayard, N. M., December, 1949; Veterans Administration Hospital, Tucson, Ariz., December, 1949; Veterans Administration Hospital, Houston, Tex., December, 1949; Veterans Administration Hospital, Columbia, S. C., January, 1950; Naval Hospital, Portsmouth, Va., February, 1950.

The patient is an asthenic white man, identified by his white hair, marked nasal septal deviation with occlusion of the right nostril, and two healed depressed scars on each side of the neck, which measure 5 cm. in length. He usually wears a beard, and reliable reports give his age as 69, his height as 5 ft. 6 in., and his weight as 100 to 110 lb. (45.4 to 49.9 kg.). There is a tattooed wreath of flowers on the left arm, just above the wrist, and a tattooed American eagle on the right arm. Adequate photographs are available from the FBI.

The hospital admission usually is attended with various theatricals, the patient pounding the left side of the chest with his fist and complaining bitterly of "pain in my heart." Despite irregular breathing with periods of apnea, there has been no evidence of circulatory impairment or cyanosis. A loud "tick-tock" sound of unequal intensity is heard throughout the chest. The ratio of this sound to the heart beat is about 3: 1 or 4: 1. If one can concentrate during the examination of the patient, despite the loud moans and cries, one can detect a regular heart rate of 60 to 66. The mean blood pressure is 110/70. In almost every instance the cardiac mechanism has been reported normal, with absence of murmurs, thrills, shocks, or unusual electrocardiographic changes. Routine laboratory findings, including complete blood counts, urinalysis, serology, and erythrocytic sedimentation rate, have been normal. Cardiac fluoroscopy has been done during many hospitalizations, revealing the markedly rapid rhythmic fluttering movement of the diaphragm, synchronous with the very audible "tick-tocks." The cardiac silhouette is normal. The studies of Goodman[1] were amplified by simultaneous electrocardiogram and phonocardiographic records. He was able to stop the flutter promptly by chilling the skin overlying the right phrenic nerve with ethyl chloride spray, suggesting the use of such a maneuver for "temporary control of this cardiodiaphragmatic syndrome and possible intractable hiccup."

It is common for the patient to be on the critical list. Unless physicians are aware of the details of the case, administration of opiates, oxygen, and various stimulants will continue. His numerous hospitalizations have already cost taxpayers thousands of dollars.

Attempts to control the diaphragmatic flutter have included left phrenicotomy, bilateral phrenic-nerve injections with procaine hydrochloride and alcohol, carbon dioxide-oxygen inhalations, and bilateral phrenemphraxis. Only temporary "relief" has ever been afforded, and a feigned "hemiplegia" followed one of the procedures. Despite close observation during one hospitalization, Whitehead and others[2] were puzzled by the detection of transient hyperpyrexia, with temperature elevations of 109 F. and 112 F., checked by rectum, mouth, and axilla, being recorded.

COMMENT

Porter[3] concluded that this case could be classed as a definite clinical picture (cardiodiaphragmatic syndrome) directly related to a functional disturbance of the diaphragm, and he suggested that abnormalities of diaphragmatic motility are more frequent than has been realized, the symptoms being mistaken for those of coronary thrombosis. Cain and Ware,[4] as well as Senter and others,[5] stressed this fact.

During both the acute and chronic stages of epidemic encephalitis, disturbances of diaphragmatic motility have been reported and classified by Marie[6] as to (1) abnormalities of the respiration proper, such as tachypnea and bradypnea, (2) spasmodic cough, and (3) respiratory tics, Dowman[7] and Gamble and others[8] have recorded cases of postencephalitic diaphragmatic tic which were more or less permanently relieved by interrupting the phrenic nerve by injections of procaine or alcohol or by sectioning, crushing, or removing the nerve.

Strauss[9] studied the distribution of phrenic nerves to the diaphragm in numerous animals and in man. He found a great deal of similarity in distribution in different species and concluded that fibers from one phrenic nerve were never observed to supply the opposite half of the diaphragm. The intercostal nerves were never found to supply the diaphragm in any of the mammals studied.

Moore and Schoff,[10] agreeing with the views of other clinicians, feel that an accessory phrenic-nerve supply exists in the patient and also add that the possibility of a "myotonic tic" of the diaphragm or lower intercostals may produce the disturbance. A post-mortem study in this case might add considerable light to the problem.

SUMMARY

A transient elderly male prevaricator has been admitted periodically to hospitals in various parts of the country. He seeks relief from "attacks" of acute precordial pain. It is not believed that paroxysmal flutter of the diaphragm, the very interesting phenomenon exhibited by the patient, is the cause of pain. However, certain clinical features of the case continue to remain a puzzle, including the etiology of the bizarre behavior of the diaphragm and the episodes of transient hyperthermia. A summary of the case has been given with a discussion of certain etiological factors which should be considered. The medical itinerary of the patient is not yet complete, and warning is made for the purpose of recognizing the patient during future hospitalizations.

Veterans Administration Hospital.

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[1] Goodman, M. J.: Paroxysmal Flutter of the Diaphragm Simulating Coronary Occlusion, J. A. M. A. **116**: 1635 (April 12) 1941.

[2] Whitehead, R. W.; Burnett, C. T., and Lagen, J. B.: Diaphragmatic Flutter with Symptoms Suggesting Angina Pectoris, J. A. M. A. **112**: 1237 (April 1) 1939.

[3] Porter, W. B.: Diaphragmatic Flutter with Symptoms of Angina Pectoris, J. A. M. A. **106**: 992 (March 21) 1936.

[4] Cain, E. F., and Ware, E. R.: Diaphragmatic Flutter with Symptoms Suggesting Angina Pectoris, J. A. M. A. **131**: 1058 (July 27) 1946.

[5] Senter, W. J.; Timberlake, L. F., and Nelson, R.: Diaphragmatic Flutter, J. A. M. A. **143**: 174 (May 13) 1950.

[6] Marie, P.; Binet, L., and Lévy, G.: Respiratory Disturbances in Encephalitis, Bull. et mém. Soc. méd. d. hôp. de Paris **46**: 1075 (July 7) 1922.

[7] Dowman, C. E.: Relief of Diaphragmatic Tic, Following Encephalitis by Section of the Phrenic Nerves, J. A. M. A. **88**: 95 (Jan. 8) 1927.

[8] Gamble, C. J.; Pepper, O. H. P., and Muller, G. P.: Postencephalitic Tic of the Diaphragm: Pulmonary Overventilation and Relief by Blockade of the Phrenic Nerve, J. A. M. A. **85**: 1485 (Nov. 7) 1925.

[9] Strauss, L. H.: Beitrag zur motorischen Innervation des Zwerchfelles bein Menschen and bei Tieren, Ztschr. f. d. ges. exper. Med. **86**: 244 (Feb.) 1933.

[10] Moore, F. H., and Schoff, C.: Paroxysmal Diaphragmatic Flutter with Symptoms Suggesting Coronary Thrombosis, Am. Heart J. **34**: 889 (Dec.) 1947.

SYSTEMIC BLASTOMYCOSIS TREATED WITH STILBAMIDINE

A PRELIMINARY REPORT

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Milton Ginsberg, M.D.
and
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Generalized North American blastomycosis is generally a fatal disease. Iodine or x-ray therapy may cause a temporary recession of the lesion. In 1945 Elson [1] reported that certain of the diamidines exerted a fungistatic effect on Blastomyces dermatitidis in vitro. This observation had been noted and discussed by one of us [2] in a review on the pharmacology, mode of action, and therapeutic possibilities of the aromatic diamidines. When the patient suffering from systemic blastomycosis, whose case history will subsequently be described, was admitted to the Veterans Administration Hospital at Ft. Howard, Md., it was deemed advisable to treat him with two of the diamidines.

REPORT OF A CASE

A 33-yr.-old Indian was admitted to another hospital on July 15, 1950. He complained of difficulty in swallowing for about one year. Dysphagia had been so severe during the previous five months that he had lost about 40 lb. (18.1 kg.) in weight. The roentgenogram of the esophagus, made on July 23, showed after the administration of barium a marked narrowing of the lumen for 3 cm. at about the level of the second and third thoracic vertebrae. Esophagoscopy performed on July 28 revealed a firm, nodular, annular, constricting, and grossly malignant-appearing lesion at the junction of the upper and middle thirds of the esophagus. Biopsy did not show any neoplastic cells. Mirror laryngoscopy findings on Aug. 3 were reported normal. Esophagoscopy was repeated on Aug. 5, and again biopsy from the esophagus did not demonstrate neoplastic changes. Attempts to pass a Levin tube at this time were not successful, but a small esophageal bougie was introduced through this area of stenosis. That night the patient complained of severe pain just to the left of the sternum, at the level of the fifth to the seventh ribs. Crepitation was noted in the subcutaneous tissues over the left clavicle. The roentgenogram of the chest showed a mediastinal collection of air. The mediastinitis responded slowly to conservative treatment. A gastrostomy was performed on Aug. 15 because the patient could not swallow food. Fluoroscopy and roentgenograms made after swallowing iodized oil (lipiodol®) on Aug. 25 showed a fistula extending from the esophagus into the mediastinum. Iodized oil was also seen in the trachea, the right main bronchus and its larger subdivisions, indicating the presence of an esophagotracheal fistula. A mediastinal abscess was also demonstrated by these examinations.

On Aug. 28 a portion of the left ninth rib was resected, and an effusion in the posterior mediastinum, as well as an anterior mediastinal abscess containing 200 cc. of purulent matter, were drained. Aerobic and anaerobic cultures made from material in the posterior mediastinal collection were sterile. The same results were reported from material in the anterior mediastinal collection of purulent matter, except that one culture showed a "yeast" which was reported as a probable contaminant. The patient did well postoperatively. Mirror laryngoscopy on Oct. 4 showed that the right side of the epiglottis, the right side of the larynx, and both vocal cords were red and edematous. Although the presence of a carcinoma had never been proved, the patient was transferred to another hospital with the diagnoses of annular carcinoma of the esophagus, esophagotracheal fistula, and bronchopleurocutaneous fistula.

At the second hospital the diagnosis of carcinoma of the esophagus was not confirmed, and it was recommended that the patient be sent to a center for thoracic surgery in the Veterans Administration.

The patient was admitted to the Veterans Administration Hospital, Ft. Howard, Md., on Nov. 8, 1950. His condition was unchanged from that described above. The epiglottis was thick and covered with a granular, friable lesion. The disease extended to the posterior pharyngeal wall and into both pyriform sinuses. A mucosal erosion was seen in the left main bronchus about 2.5 cm. below the carina. The upper portion of the esophagus was red and roughened, and an obstruction was encountered about 2.5 cm. below the cervical constriction. Biopsy from the epiglottis showed that the infection was due to B. dermatitidis. Three hundred thousand units of aqueous crystalline procaine penicillin G were given intramuscularly daily from Nov. 25 through Dec. 13. An abscess in the lower portion of the anterior cervical region was incised and drained. B. dermatitidis was isolated on culture from the purulent drainage material.

The patient was placed on a low protein, low purine diet on Dec. 15, since this type of diet is reported to favor the action of stilbamidine (4,4'-stilbenedicarboxamidine). Treatment with stilbamidine and propamidine (4,4'-diamidino 1,3-diphenoxy propane) was started on Dec. 16. Since fibrin and desoxyribonucleoprotein are important components of inflammatory exudate, it seemed well to remove them from the involved areas by using streptokinase and streptodornase. Twenty-five thousand units of streptokinase and 15,000 units of streptodornase dissolved in 5 cc. of isotonic sodium chloride solution were inserted into the left bronchopleurocutaneous fistual. After an incubation period of four hours the wound was washed with 3 cc. of isotonic sodium chloride solution, and 5 cc. of a 0.1% solution of propamidine in 5% dextrose in distilled water was inserted into the fistula. The nasopharynx was sprayed with a sodium chloride solution of the enzymes, and after four hours the solution of propamidine was sprayed into the nasopharynx. Stilbamidine (0.05 gm.) in 100 cc. of 5% dextrose in distilled water was given slowly intravenously.

On Dec. 18 the intravenous dose of stilbamidine was increased to 0.1 gm. All other treatment as outlined above, was continued. In addition, the topical application of 25,000 units of streptokinase and 15,000 units of streptodornase to the wound in the neck was employed. The amount of stilbamidine was increased to 0.15 gm. on Dec. 20. By Dec. 22 the wound in the neck was unusually clean, but it was slow in healing. Daily treatment with 0.15 gm. of stilbamidine given intravenously was begun on Dec. 22 and continued through Jan. 3, 1951. Marked improvement in the patient's general condition occurred. A gradual decline in the febrile course was noted, and the temperature reached normal limits by Jan. 5.

Laryngoscopy was performed again on Jan. 10, and the inflammatory condition was seen to have receded considerably. The epiglottis was still somewhat thickened. Biopsy showed only a few poorly defined B. dermatitidis. Comparison with previous examinations showed a remarkable change in the amount and degree of inflammation and cellular changes in the epithelium.

A second course of therapy similar to that just described was initiated on Jan. 19. The initial dose of stilbamidine was 0.15 gm. and was continued daily through Feb. 1. Laryngoscopy, on Feb. 16, showed progressive resolution of the inflammatory process. Biopsy showed only a rare B. dermatitidis in scarred connective tissue. The lesions on the arm and face had dried up.

Reviewed in the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions published by the authors are the result of their own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

From the Department of Preventive Medicine, Johns Hopkins University School of Medicine (Dr. Schoenbach and Dr. Long) and the Surgical Division, Veterans Administration Hospital, Ft. Howard, Md., and the Department of Surgery, Johns Hopkins University School of Medicine (Dr. Miller and Dr. Ginsberg).

The stilbamidine diisethionate and propamidine isethionate were supplied by Merck & Company, Inc.

[1] Elson, W. O.: The Antibacterial and Fungistatic Properties of Propamidine, J. Infect. Dis. 76: 193-197 (May-June) 1945.

[2] Schoenbach, E. B., and Greenspan, E. M.: The Pharmacology, Mode of Action and Therapeutic Potentialities of Stilbamidine, Pentamidine, Propamidine and other Aromatic Diamidines: a Review, 27: 327-377 (Sept.) 1948.

A third course of stilbamidine was begun on March 5 and continued through March 15. No toxic effects from the stilbamidine were noted. The patient had continued to improve generally. His appetite was good, and he gained 37 lb. (16.8 kg.) in weight. The esophagomediastinal and the bronchopleurocutaneous fistulas closed. Laryngoscopy performed on March 27 showed a complete recession of the inflammatory condition. The epiglottis was healed, although scarred. Biopsy from the epiglottis did not show B. dermatitidis.

SUMMARY

Two of the aromatic diamidines, stilbamidine and propamidine, have been used in the treatment of a patient suffering from advanced generalized North American blastomycosis. The immediate therapeutic effects of these compounds were excellent. A second patient with generalized blastomycosis has responded favorably to treatment with stilbamidine, and a third, ill with nocardiosis, has shown marked improvement under similar therapy. It is suggested that the diamidines be given an extensive trial in the treatment of severe yeastlike infection.

615 N. Wolfe St. (Dr. Long).

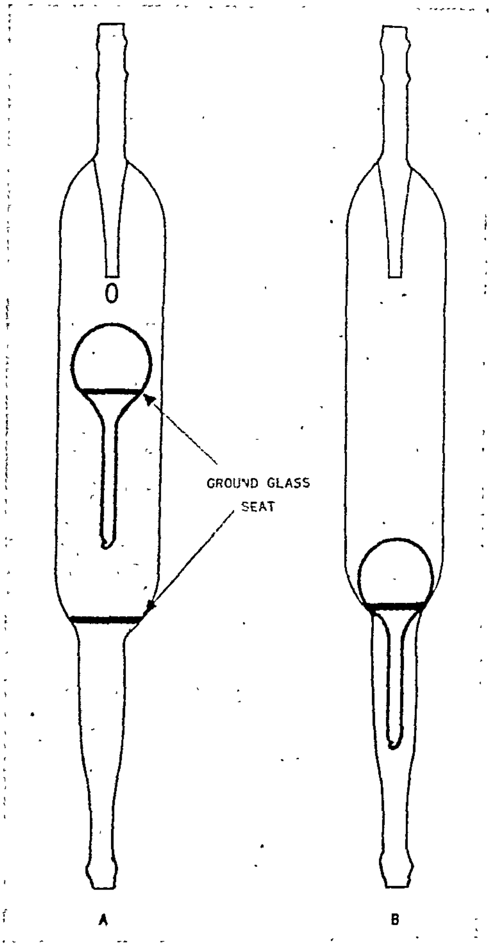
DEVICE TO PREVENT AIR EMBOLISM IN BLOOD TRANSFUSIONS UNDER PRESSURE

Charles F. Wilkinson Jr., M.D., New York

There have been several references [1] in recent journals questioning the advisability of utilizing blood transfusions under pressure because of the possibility of the blood leaving the system too rapidly and air entering the body, with resulting fatal air emboli. It is generally agreed that if the person who is introducing the air under pressure into the transfusion bottle has nothing else to do, he can stop the transfusion before air enters the vein. Recently, however, instances have been reported to me in which during the stress of operating attention was diverted from the transfusion bottle and air entered the recipient's veins, with fatal air emboli resulting.

The device presented here has been designed with the knowledge that it involves no new principle, but it is felt that its use in connection with pressure transfusions is new and can serve as a life-saving safety mechanism. As can be seen from the illustration, the device presented here is a dropping attachment which is placed between the transfusion bottle filter and the needle. The speed of the transfusion can be controlled by regulating the number of drops per minute. The only change from the usual dropping flask has been the incorporation of a glass float which has been weighted, so that it will float just below the surface of the blood in the dropping flask (fig., *A*). Also, there has been a ground glass seat made, so that, when the blood runs out (fig., *B*), there is a tight joint between the glass bulb and the dropping flask. It will be noted that in this position there is an effective seal between the air under pressure in the transfusion bottle and the patient, so that no air can enter the vein. It might be pointed out that the more pressure placed in the bottle after the blood has flowed out, the more tight and secure will be the seal caused by the float resting on the lower neck of the dropping bottle at the ground glass seat.

Since this modification of the ordinary dropping flask is made entirely of glass, it can be readily sterilized and cleaned. It can be used in an ordinary blood bank transfusion set by substituting it for the ordinary dropping bottle below the filter, or, in cases where the filter is combined with the dropping bottle, it can be added as a second dropper.



A, the normal position of the float when a transfusion is in progress. Should all of the blood be forced out of the transfusion bottle, the float will descend, forming an air-and-liquid-tight seal at the ground glass seat, as in *B*.

If a device such as this were to be incorporated in each transfusion set sent to the operating room and it were necessary to start pressure in connection with a transfusion already in progress, the safety device would already be present and would function automatically.

SUMMARY

A simple but effective device to prevent air emboli resulting from blood transfusion under pressure is presented.

From the Department of Medicine, Post-Graduate Medical School of the New York University-Bellevue Medical Center, and the Fourth Medical (N.Y.U.) Division, Bellevue Hospital.

[1] Wiener, A. S.: Foolproof Blood Transfusions, Lancet 1: 1073 (June 18) 1949; Transfusions with Positive Pressure, Correspondence, J. A. M. A. 142: 837 (March 18) 1950. Murphy, W. P.: Transfusions with Positive Pressure, Correspondence, ibid. 143: 673 (June 17) 1950.

BLADDER DYSFUNCTION FOLLOWING INGESTION OF PHENINDAMINE TARTRATE (THEPHORIN®)

Charles A. W. Uhle, M.D.
and
H. Roebling Knoch, M.D., Philadelphia

The symptom of difficulty in micturition, classified as a toxic manifestation induced by the antihistaminic drugs, has been infrequently observed. Rives, Ward, and Hicks[1] reported, in a brief review, that varied toxic reactions occurred with therapeutic use of antihistaminic drugs in 25% to 65% of cases. No reference was made in this report to symptoms of bladder dysfunction.

Wolfson[2] recently reported a case in which difficulty in urination followed the use of tripelennamine (pyribenzamine) hydrochloride. In September, 1948, we observed symptoms similar to those described by Wolfson following the use of phenindamine (thephorin®).

REPORT OF CASE

The patient, a white male in excellent health, 53 years of age, was seen in consultation Sept. 9, 1948, for symptoms similar to those of urinary obstruction.

On Sept. 5, phenindamine tartrate tablets, 25 mg. each, twice a day, had been prescribed by the family doctor for symptoms of hay fever. About Sept. 7, after ingesting approximately 150 mg., the patient noted that urination was difficult. The urinary stream, which had been of adequate caliber, was diminished to a trickle. It was difficult to expel the entire content of the bladder. There was associated burning on urination, and dull pain was present in the suprapubic region. There was no frequency or urgency. Nocturia was not a prominent symptom.

On Sept. 9, after the total ingestion of approximately 225 mg., medication was discontinued. Symptoms were gradually ameliorated, and normal urination was restored in four days, by Sept. 13.

Prior to this episode the patient had had no symptoms of any kind except from the rhinitis of hay fever, which phenindamine incidentally helped.

The physical examination done with special attention to the urologic tract, showed results within normal limits. The prostate was not enlarged, and the bladder was not distended. Diagnostic instrumental and roentgen procedures were not employed. Results of urinalysis were within normal limits.

The patient has been observed for more than one and one-half years and has had no further urinary difficulty. He refused a retrial of phenindamine therapy, in contrast to Wolfson's patient, in whom Wolfson was able to "prove the validity of the assumption that the distress was due to the antihistaminic agent," tripelennamine.

COMMENT

In a review of the literature on antihistamine substances, for the purpose of ascertaining the incidence of urologic symptoms of toxicity, Wolfson's case is the only one found wherein symptoms of urinary difficulty were present.

Feinberg[3] reported side reactions of burning on urination when tripelennamine was used. Kleckner[4] stated that diphenhydramine (benadryl®) and tripelennamine, given in a large clinical series, produced pronounced reactions, including urinary frequency. He mentioned that McElin and Horton of the Mayo Clinic reported urinary frequency as a noticeable effect of diphenhydramine. Feinberg referred to Arbesman, who reported burning on urination as an occasional side reaction. McGavack and associates[5] reported the incidence of toxic symptoms following phenindamine therapy to be, in descending order of frequency: oral dryness, insomnia, constipation, dizziness, jumpiness, conjunctival burning, intestinal cramps, drowsiness, weakness, and palpitations. No urologic symptoms were noted, an observation that conformed with the clinical studies of phenindamine by Boyd and associates.[6] The conclusion can therefore be drawn, after a substantial clinical trial of the antihistamines, that symptoms of urinary difficulty are not commonly encountered as a reaction to these drugs.

Dr. W. T. Strauss of Hoffmann-LaRoche, Inc.[7] has written, "We have had a few case reports from physicians who stated that a very small number of their patients complained of difficulty in urination following the use of thephorin. Just as soon as thephorin medication was discontinued the symptoms disappeared and no sequelae were observed."

We have had personal communications from two colleagues who noted this symptom complex in two male patients for whom diphenhydramine and tripelennamine had been prescribed. In the first case, an abdominoperineal resection of the rectum for carcinoma had been performed. After the immediate convalescence normal bladder function was resumed. Diphenhydramine therapy nine months later for bronchial asthma produced difficulty in urination as described in the case reported above. A latent period of two days was noted before symptoms appeared. Three days after diphenhydramine was withdrawn, normal function was restored. In the second case, a physician, with an established diagnosis of early benign prostatic hypertrophy but with no obstructive urinary symptomatology, took tripelennamine. There was a latent period of three days before symptoms of obstruction occurred. Medication was stopped. An indwelling urethral catheter was worn for three days and then removed. Four days after removal of the catheter, or 10 days after the initial dose, normal urination was restored. This patient has remained well for more than two years with no further urinary complaints. In neither of these two cases were antihistamine drugs prescribed again.

Urinary retention as a complication of antihistamine therapy is probably the result of a disturbance of the sympathetic-parasympathetic balance. Whether this is due to potentiation of epinephrine or antagonism of acetylcholine is difficult to say, although available data suggest that it may be the latter. The net result, of

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From the Departments of Urology and Medicine, Lankenau Hospital.

1. Rives, H. F.; Ward, B. B., and Hicks, M. L.: A Fatal Reaction to Methapyrilene (Thenylene), J. A. M. A. **140**: 1022 (July 23) 1949.
2. Wolfson, S. A.: Urinary Obstruction Due to Tripelennamine Hydrochloride, J. A. M. A. **140**: 958 (July 16) 1949.
3. Feinberg, S. M.: Histamine and Antihistaminic Agents: Their Experimental and Therapeutic Status, J. A. M. A. **132**: 702 (Nov. 23) 1946.
4. Kleckner, M. S., Jr.: Clinical Appraisal of Benadryl, Pyribenzamine and Anthallan in the Treatment of Allergic Disorders, Ann. Int. Med. **28**: 583, 1948.
5. McGavack, T. H., and others: Clinical Evaluation of Phenindamine as an Antihistaminic Agent, Am. J. M. Sc. **216**: 437, 1948.
6. Boyd, L. J.; Weissberg, J., and McGavack, T. H.: Tolerance Studies of the Antihistamine Drug Thephorin, New York J. Med. **48**: 1596, 1948.
7. Strauss, W. T.: Personal communication to the authors.

course, would be the same in either case—predominance of sympathetic stimuli, resulting in relaxation of the fundus and contraction of the sphincter.

The evidence for parasympatholytic and adrenergic action of antihistamines in general has been reviewed by Loew [8] and by Meier and Bucher.[9] Both reviews mention the known antiacetylcholine action of the antihistamines. This varies considerably among compounds, with diphenhydramine and tripelennamine the most active, but is always much weaker than that of atropine.[10] Many of the antihistamines also potentiate the pressor effect of epinephrine,[11] but there seem to be little data on potentiation of other epinephrine effects, such as that on smooth muscle. The reviewers mentioned above concluded that epinephrine potentiation is not a necessary characteristic of antihistamines,[8] and this is confirmed by the antihistaminic action of some of the β-haloethylamine sympatholytics of the dibenamine® (N,N-dibenzyl-β-chloroethylamine HCl)[12] or Sy-28 type (α-naphthylmethylethyl-β-bromoethylamine hydrobromide).

It may be postulated that the symptoms of urinary difficulty following phenindamine therapy are the result of an antiacetylcholine (anticholinergic) action upon the vesical detrusor mechanism. The physiologic components involved in micturition are complex. Normal detrusor action by cholinergic stimulation implies the reciprocal action of bladder wall contraction and vesical neck relaxation. Anticholinergic response would imply the reverse action between the bladder muscle and sphincter. The symptom complex of urinary difficulty following antihistaminic therapy appears to be due to detrusor weakness associated with sphincteric spasticity.

SUMMARY

A case of difficulty in expelling the contents of the urinary bladder following phenindamine tartrate (thephorin®) ingestion is presented. This toxic symptom disappeared after the drug was withdrawn. There were no sequelae.

The detrusor muscle of the urinary bladder is contracted by cholinergic drugs. It has been postulated that phenindamine, by virtue of its anticholinergic action, can have the reverse effect upon the vesical detrusor muscle in the human by weakening detrusor contraction and causing increased tonus or spasm in the vesical sphincter. Symptoms simulating urinary retention are thus produced. Analysis of the patient's symptoms tends to corroborate this impression.

Attention is drawn to the recognition of symptoms of urinary obstruction and their relationship to the antihistaminic substances. Failure to analyze these symptoms in the male may lead to erroneous diagnosis with the possibility of unnecessary surgical intervention.

255 S. 17th Street.

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[8] Loew, E. R.: Pharmacology of Antihistamine Compounds, Physiol. Rev. **27**: 542, 1947.

[9] Meier, R., and Bucher, K.: Pharmakologie der Antihistaminica, Fortschr. Allergielehre **2**: 290, 1949.

[10] (*a*) Sherrod, T. R.; Loew, E. R., and Schloemer, H. F.: Pharmacological Properties of Antihistamine Drugs, Benadryl, Pyribenzamine and Neoantergan, J. Pharmacol. & Exper. Therap. **89**: 247, 1947. (*b*) Graham, J. D. P.: Comparison of Some Anti-Histamine Substances, ibid. **91**: 103, 1947. (*c*) Lehmann, G.: Pharmacological Properties of a New Antihistaminic 2-Methyl-9-Phenyl-2,3,4,9-Tetrahydro-1-Pyridindene (Thephorin) and Derivatives, ibid. **92**: 249, 1948.

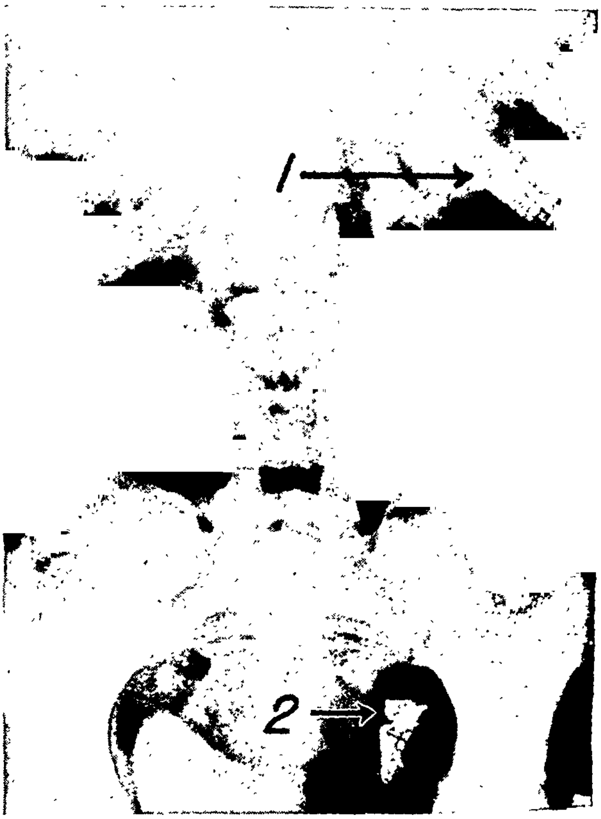
[11] Sherrod, Loew, and Schloemer.[10a] Lee, H. M.; Dinwiddie, W. G., and Chen, K. K.: Antihistamine Action of N-(2-Pyridyl)-N-(2-Thenyl)-N', N'-Dimethylethylenediamine Hydrochloride, J. Pharmacol. & Exper. Therap. **90**: 83, 1947.

[12] Loew, E. R., and Micetich, A.: Adrenergic Blocking Drugs: Comparisons of Effectiveness in Decreasing Epinephrine Toxicity in Mice, J. Pharmacol. & Exper. Therap. **93**: 434, 1948.

NEW DESIGN OF RADIOPAQUE ELEMENT FOR SURGICAL SPONGES

George Levene, M.D., Boston

While it is extremely rare for a roentgenologist to be called on to locate a surgical sponge, such an occasion demands a positive answer in the shortest possible time. Numerous devices have been employed to mark surgical sponges so that they may be identified on a roentgenogram. These include lead disks or metal staples fastened to the sponge, barium-impregnated thread woven into the sponge, barium-impregnated strips, and others. All of these fall short in meeting the requirement of positive identification. For example, the staple may resemble a metal clip commonly used by many surgeons for hemostasis. The small barium strip may overlie a transverse process of a lumbar vertebra, which it resembles, and not



Specimen film, which shows that *1*, even when overlying bone, the density and pattern of the sponge make it plainly visible; 2, when crumpled into a small mass, the sponge may still be identified by its pattern.

Professor of Radiology, Boston University School of Medicine, and Chief, Department of Radiology, Massachusetts Memorial Hospitals, Boston.

be recognized, and most other identifying devices may possibly be confused with something normally used at operation, or be obscured by the shadow of anatomical structures. It is obvious that to fulfill its function in this respect a marker must be plainly visible on a roentgenogram that is sometimes taken in difficult circumstances, as in an operating room, and be so eye-arresting that it is instantly identified in any part of the body.

A satisfactory solution was obtained with a new design of radiopaque element (fig.) vulcanized into the sponge so that it cannot be shaken out.[1] The opacity and pattern of this opaque element are such that it may be visualized and identified in any part of the body.

ANOMALY OF THE VENA CAVA INFERIOR

REPORT OF FATALITY AFTER LIGATION

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A. E. Greer, M.D.
and
E. C. Sifers, M.D., Cleveland

Congenital abnormalities of the vena cava are rarely of clinical significance. A review of the medical literature reveals numerous case reports of caval abnormalities based on cadaver dissection; few have been demonstrated in the living patient. Most of the anomalies encountered clinically have been associated with the vena cava superior. In the latter group, the persistent left superior and bilateral superior vena cava are most commonly described.[1] Similar anomalies occur in the inferior cava but have been reported less frequently.

Urologists occasionally find an abnormal inferior caval pattern associated with retrocaval ureter. In 1925, McClure and Butler[2] described the development of the vena cava inferior and associated anomalies. They believed that the left vena cava inferior was the last embryonic vessel to disappear and, for this reason, expected a greater number of anatomic variations associated with it. Maxwell and Erwin in 1928[3] reported on four anomalies of the vena cava inferior encountered in the dissecting room. They supplemented their report with an extensive bibliography, which included more than 50 reports of anomalies of the vena cava inferior discovered during anatomic dissection.

We have been unable to find a report of a case in which an anomalous vena cava inferior presented itself as a major surgical complication above the diaphragm. In a limited review of available anatomic records, we have found no reported instance where the hepatic vein emptied directly into the right auricle and was completely independent of the vena cava inferior. This case is presented because: (1) an unusual anomaly of the vena cava inferior existed; (2) death followed ligation and partial excision of the anomalous vessel, and (3) in retrospect it is realized that this anomaly could have been recognized and the surgical problem successfully managed.

REPORT OF A CASE

The patient was a 54-year-old white man who had been in good health until March, 1950. At that time a cough developed and he became aware of a sensation of irritation in his trachea. The cough was not productive, but was flecked with blood on several occasions. The remainder of the history was essentially noncontributory. Physical examination on June 5, 1950, revealed an unusually well-developed man whose temperature, pulse, and blood pressure were within normal limits. The significant findings were confined to the thorax. Expansion of the chest was equal bilaterally. On palpation, there was diminished tactile fremitus over the right upper thorax. Auscultation revealed a persistent rhonchus over the right anterior chest wall that could be heard on both inspiration and expiration. The left side of the chest appeared to be normal. Roentgenographic studies revealed a prominence in the right hilar region, with linear shadows of increased density extending outward from the upper part of the hilum. Laboratory studies elicited essentially normal findings.

On June 6 a bronchoscopic examination was performed. The tracheobronchial tree and vocal cords were normal except for the right main stem bronchus. A neoplasm extended into the lumen of the bronchus approximately 1 cm. below the carina at the level of the right upper lobe; the neoplasm appeared to be eroding through the posterior membranous portion of the bronchus rather than from the orifice of the upper lobe. On biopsy it was found to be an undifferentiated carcinoma, grade 4 dedifferentiation. The nature of the patient's disease was discussed, and he was advised to undergo an exploratory thoracotomy with possible eventual right total pneumonectomy.

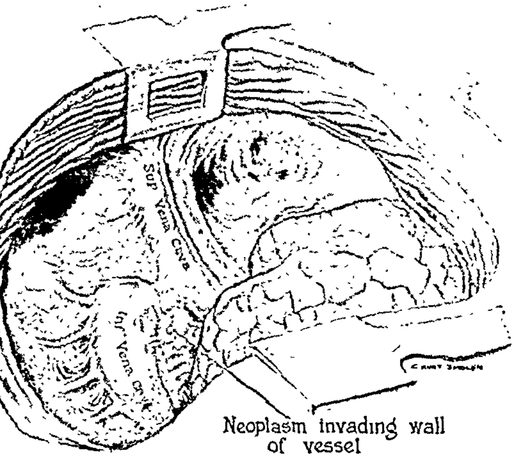

Fig. 1.—Drawing showing operative findings; the neoplasm arises from the right bronchus at the level of the upper lobe.

A right thoracotomy was performed on June 15. Inspection of the right lung demonstrated a neoplasm that appeared to be arising in the main bronchus just above the orifice of the right upper lobe. Although the carcinoma was exceedingly close to the carina, it was felt that a plastic closure of the trachea could be performed after total pneumonectomy. A number of dis-

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[1] Manufactured by Bauer and Black, Division of the Kendall Company, Chicago.

From the Cleveland Clinic, and the Frank E. Bunts Educational Institute.

[1] Bestard, A.: Sobre un caso de vena cava superior izquierda con ausencia de la derecha, An. Fac. de cien. méd. Asunción **5**: 397, 1945. Chouke, K. S.: Case of Bilateral Superior Vena Cava in Adult, Anat. Rec. **74**: 151 (June 25) 1939. Dohn, B.: Persistence of Left Vena Cava Superior, with Report of Case, Acta. path. et microbiol. Scandinav. **21**: 411, 1944. McManus, J. F. A.: Case in Which Both Pulmonary Veins Emptied into Persistent Left Superior Vena Cava, Canad. M. A. J. **45**: 261 (Sept.) 1941. Prows, M. S.: Two Cases of Bilateral Superior Venae Cavae, One Draining Closed Coronary Sinus, Anat. Rec. **87**: 99 (Sept.) 1943.

[2] McClure, C. F. W., and Butler, E. G.: Development of Vena Cava Inferior in Man, Am. J. Anat. **35**: 331 (July) 1925.

[3] Maxwell, E. V., and Erwin, G. S.: Four Cases of Anomalous Inferior Vena Cava with Explanation of Their Developmental Origin, J. Anat. **62**: 184 (Jan.) 1928.

eased lymph nodes were observed around the hilum and in the mediastinum. Frozen section examination of the excised nodes did not reveal carcinoma. The most interesting observation was a dilated vein in the normal position of the azygos vein. The vessel entered the vena cava superior in the expected position but was dilated considerably below the point of junction. The bronchiogenic neoplasm had extended through the posterior wall of the bronchus and invaded this dilated vessel. The vessel wall and the adjacent bronchus were fixed at the site of carcinomatous invasion. It was apparent that pneumonectomy could not be performed without sacrifice of the involved segment of the vein. The vein did not descend in its usual right paravertebral position but assumed a retroesophageal position at the level of the seventh dorsal vertebra and entered the left side of the chest. It could not be determined whether this vessel was unusually enlarged because of obstruction by the invading neoplasm or because of congenital abnormality. There was no question that the vessel was following an abnormal course in its approach to the left side of the chest. The possibility that it might represent the vena cava inferior was considered, but inspection of the right diaphragm and the caval hiatus revealed a normal vessel entering the right auricle at this level. It was decided to ligate this vessel above and below the point of invasion and resect a generous segment of the dilated vessel with the lung. This procedure, as well as total pneumonectomy, was carried out.

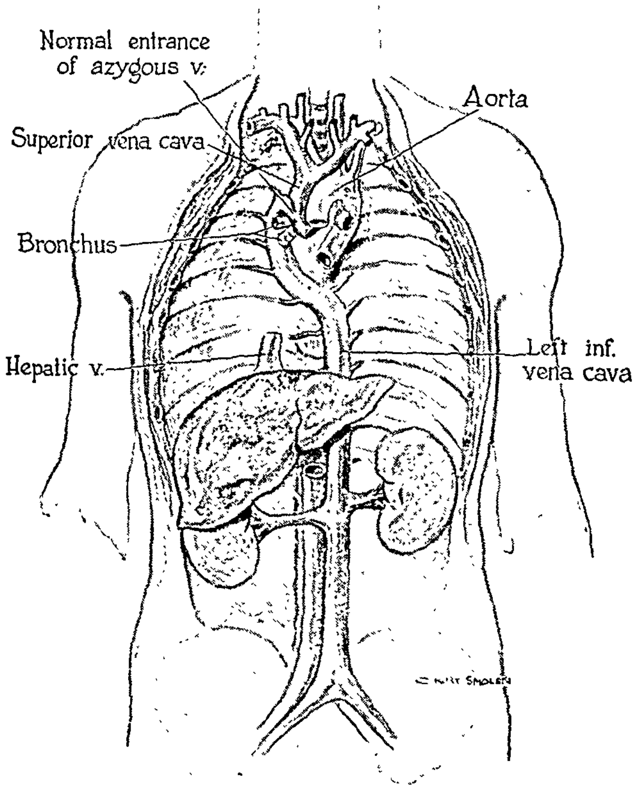

Fig. 2.—Schematic reproduction of the major veins as revealed by autopsy.

After ligation of the large anomalous vessel, the anesthetist reported a transient drop in the blood pressure, but this was interpreted as the result of a mechanical defect in the endotracheal system. The pressure was stabilized and maintained with phenylephrine (neo-synephrine®) hydrochloride and intravenous fluids. The remainder of the operation was uneventful.

The patient reacted promptly after surgery, but the tendency toward hypotension persisted. It was necessary to maintain a continuous drip of phenylephrine hydrochloride to keep the blood pressure above a renal filtration level. Approximately six hours after surgery the phenylephrine was supplemented with arterenol® and 20 cc. of adrenocortical extract in a continuous intravenous drip. The patient was catheterized at 11 p. m. on the night of operation, and approximately 100 cc. of urine containing clots and bright red blood was obtained. The patient's peripheral blood was centrifuged, and the serum was a normal color. The possibility of a severe transfusion reaction while under anesthesia was considered, but the absence of gross hemolysis in the patient's serum contraindicated this possibility. The cardiorespiratory system appeared to function satisfactorily on the first postoperative day; the patient was remarkably alert and completely free of pain or discomfort. Spinal fluid obtained 20 hr. after the operation contained blood, however, and it became apparent that the patient had suffered inadvertent ligation of an anomalous vena cava inferior, and that the presence of blood in the spinal fluid and bladder undoubtedly represented direct bleeding from the resultant high venous pressure. A program of therapy that included maintenance of blood pressure above a renal filtration level by phenylephrine hydrochloride, norepinephrine (arterenol®), and adrenocortical extract was outlined. Continuous spinal anesthesia to a level of fourth dorsal vertebra was administered at 1:15 p. m. and maintained for approximately six hours on the first postoperative day. The patient remained alert and appeared cheerful, until at approximately 7:15 p. m. he suddenly became apprehensive, cyanotic, and assumed a shocklike state. His condition deteriorated rapidly thereafter, and he died within the next hour.

Post-mortem examination was performed about two hours after death. Approximately 800 cc. of serosanguineous fluid was found in the right thorax. The mediastinum was in the mid-line and the left lung appeared essentially normal. The ligated stump of the anomalous vessel was revealed; it appeared to be dilated and tense. It was dissected along its entire course and found to enter the left mediastinum retroesophageally and to descend below the diaphragm anterior to the aorta. Intercostal veins communicated with it directly and there was no evidence of an azygous or hemiazygous system. Both renal veins communicated directly with the left-sided vena cava, as did the common iliac vessels. There was evidence of a recent massive retroperitoneal hemorrhage that had dissected the leaves of the mesentery and filled the entire retroperitoneal area with fresh clots. This was the immediate cause of death. The hepatic vein drained directly into the right auricle and in no way communicated with the vena cava inferior. The gross appearance of the hepatic vein above the diaphragm was typical of a normal vena cava inferior. The portal system was drained entirely independently of the vena cava, and did not share the severe venous hypertension produced by ligation of this vessel.

COMMENT

Although anomalies of the major blood vessels are rarely encountered during surgical intervention, their recognition is mandatory. For many years experienced surgeons have taught that large anomalous vessels encountered in the abdomen must not be ligated. Experience has apparently made the surgeon wary of the vascular anomaly.

Whereas anomalies of the vena cava inferior are probably not uncommon, they are rarely of clinical significance. We have found no report of a case in which such an anomalous vessel has been invaded by a primary carcinoma in an adjacent structure, nor have we found any description of a venous pattern in which the systemic venous return was drained independently of the portal system into the vena cava superior by a persistent left vena cava inferior. The presence of the hepatic vein prompted the erroneous diagnosis at the time of operation and resulted in the fatal technical error of ligation. In retrospect it is seen that partial occlusion of this anomalous vena cava could have been performed, with subsequent resection and reconstruction of the involved vessel wall.

ETHYLENE DICHLORIDE PLASTIC CEMENT: A CASE OF FATAL POISONING

H. B. Lochhead, M.D.
and
Henry P. Close, M.D., Coatesville, Pa.

Ethylene dichloride, a chlorinated hydrocarbon (CH_2Cl-CH_2Cl) with an aromatic chloroformlike odor, is an oily, colorless fluid slightly soluble in water. It is used in large amounts industrially as a degreasing reagent, a cholesterol extractor, a fumigator, and a solvent for oils, waxes, and rubber. It has been known to be highly toxic since its use as an anesthetic more than 100 yr. ago. Heppel and others [1] recently have described the pathological findings in laboratory animals subjected to poisoning by the chemical. Despite its widespread use industrially it has not produced a fatality in any of the reported cases of poisoning by inhalation. On the other hand, ingestion is generally followed by death. Ten such cases have been found in the world literature.[2] However, only one of these cases is reported in the American literature. The substance was mistaken for liquor by the majority of the victims. They rapidly became nauseated, vomited, were prostrated, and lapsed into unconsciousness. Death resulted four and one-half to 91 hr. following ingestion. The longest period of survival occurred in those having gastric lavage soon after the ingestion. Findings in the cases that came to autopsy generally included acute hemorrhagic gastritis or enteritis, congestion of the principal viscera, toxic hepatitis and nephrosis, and microscopic hemorrhages throughout the brain.

Ethylene dichloride readily dissolves certain plastics; the use of this chemical as a plastic cement is common not only in industry but in occupational therapy shops and in homes where work with plastics is a hobby. Because of its increasing use in these areas, we believe this report of a fatality following the ingestion of ethylene dichloride plastic cement is indicated.

REPORT OF A CASE

A white man, age 50, had been hospitalized for schizophrenic psychosis continuously since 1938. During his course in the hospital he regressed considerably, manifesting hallucinations and untidiness. He exhibited pica, ingesting various foreign substances, such as cigaret butts, papers, buttons, and other detritus which he scavenged. On Aug. 1, 1950, the patient was in an occupational therapy shop of the hospital. Despite the watchfulness of the therapists and aides, the patient was able successfully to secrete on his person a 240 ml. (8 oz.) bottle of plastic cement (ethylene dichloride) and surreptitiously to drink approximately 30 ml. (1 oz.) of the material. Subsequent investigation indicated that this material was ingested sometime between 9:30 and 9:50 a. m. However, the symptoms were not manifested until 10:10 a. m., when the patient was found lying unconscious on a bench in the recreation area of the hospital. Examination by a physician at 10:15 a. m. showed that he had vomited dark fluid containing tin foil and cigaret butts. He was transferred immediately to a medical ward, where he rapidly became cyanotic and unconscious, with dilated, fixed pupils. Signs of acute pulmonary edema were present. Despite intensive emergency therapy, respiratory difficulty increased and a tracheotomy was performed at noon. During this interim the patient frequently vomited thick, darkred fluid having the characteristic aromatic odor of ethylene dichloride and containing small, oillike globules. The patient's condition continued to deteriorate; consciousness was not regained and death supervened at 7:15 p. m. the same day, approximately 10 hr. after ingestion of the poison. Permission for autopsy was obtained, and the examination performed. The principal findings were diffuse hemorrhagic gastritis, bilateral pulmonary congestion, acute necrotizing bronchiolitis and bronchitis, acute toxic nephrosis, diffuse hepatic necrosis, and hyperemia of the brain with scattered perivascular hemorrhages in the pons. The thick bloody fluid found in the stomach and the bladder urine had the characteristic odor of ethylene dichloride. Samples of blood, liver, and kidney tissues were subjected to distillation; the distillate contained no aromatic hydrocarbon.

COMMENT

The toxicity of ethylene dichloride and similar plastic solvents apparently is not well recognized by workers in plastics, particularly at the occupational therapy and hobby level. Unfortunately, in our own instance the product was delivered from the jobber with a plain label bearing only the jobber's name and the name of the chemical. No warning of any kind appeared on the label to indicate the toxicity of the product.

Although only one other case of a fatality resulting from the ingestion of ethylene dichloride has been reported in the American literature, the widespread and increasing use of this type of plastic cement carries with it implications of serious import should proper warning of its poisonous nature not be indicated on containers in which this chemical is merchandized. Particular reference is made to the known predilection of children for experimenting with and swallowing unknown liquids when they are readily available.

Veterans Administration Hospital, Coatesville.

From the Veterans Administration Hospital.

Sponsored by the Veterans Administration and published with approval of the Chief Medical Director. The statements and conclusions published by the authors are a result of their own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

[1] Heppel, L. A.; Neal, P. A.; Perren, T. L.; Endicott, K. M., and Porterfield, V. T.: The Toxicology of 1, 2-Dichlorethane (Ethylene Dichloride): Its Acute Toxicity and Effect of Protective Agents, J. Pharmacol. & Exper. Therap. **84**: 53-63, 1945.

[2] (*a*) Hueper, W. C., and Smith, C.: Fatal Ethylene Dichlorid Poisoning, Am. J. M. Sc. **189**: 778-784, 1935. (*b*) Wendel, H.: Death Due to Dichlorethane Poisoning, Pharmazie, Berlin **3**: 398-400 (Sept.) 1948. (*c*) Roubal, J.: Two Cases of Fatal Poisoning by Peroral Ingestion of Ethylene Dichloride. Ćasop. lék. česk. **86**: 203-206, 1947. (*d*) Bloch, W., cited by Roubal.[2c] (*e*) Ienistea, C., and Mezincesco, M. D.: Fatal Poisoning from Ingestion of Ethylene Dichloride, Bull. Acad. Med. Roumanie **8**: 614-617, 1943. (*f*) Hulst, J. P. L.; Steenhauer, A. J., and Kedde, D. L.: Fatal Ethylene*di*chloride Poisoning, Nederl. tijdschr. v. geneesk. **90**: 406-407, 1946. (*g*) Van Meurs and Keyzer, cited by Hulst, Steenhauer and Kedde.[2f]

Thyrotoxicosis.—Surgical removal of the thyroid gland still remains the major therapeutic measure in the vast majority of patients with the conventional type of Graves' disease, but the success of the operation depends to a large degree on the quality of the preoperative preparation. Up to but a few years ago this attempt at preparation involved several weeks or even months of hospitalization, the administration of iodine, and anxious waiting for the day when a remission would be sufficiently advanced to reduce the hazard of surgical intervention. Even then, failures to secure satisfactory remission were numerous and postoperative thyroid storms were frequent. The use of propylthiouracil together with iodine has materially changed the outlook. With these measures adequate preoperative preparation is more rapid, more certain and more complete. It can be carried out with the patient in the ambulant state. Admission to the hospital may be postponed up to a few days prior to the date set for the operation. Postoperative thyroid storms have practically vanished. In centers best equipped for the management of Graves' disease mortality from thyroidectomy has virtually disappeared.—Harry Gold, M.D., Management of Thyrotoxicosis, Conference on Therapy, *American Journal of Medicine*, April, 1951.

COUNCIL ON PHYSICAL MEDICINE AND REHABILITATION

REPORT OF THE COUNCIL

The Council on Physical Medicine and Rehabilitation has authorized publication of the following report.

The Council wishes to express its appreciation for the valuable cooperation of the Advisory Committee on American Health Resorts for its expert services. The Committee members are Drs. F. A. Hellebrandt, M. B. Jarman, Walter S. McClellan and Euclid M. Smith. Howard A. Carter, *Secretary.*

THE HEALTH RESORT IN THE MANAGEMENT OF CHRONIC DISEASE

A health resort is an institution which gives major attention to the systematic use of climatic and other natural therapeutic resources, including mineral waters and peloids, with which it is endowed by virtue of geographic location. Various sections of the United States are subject to widely different climatic conditions, some of which offer therapeutic advantages not obtainable elsewhere. All types of mineral waters thought to have therapeutic value are found in this country.[1] How gifts of nature may be utilized for healing purposes in institutions especially designed to expedite their application has been discussed in the growing literature on rehabilitation.[2] Rusk's [3] concept of the third phase of medical care, which carries the patient beyond diagnosis and definitive treatment to full restoration of function, has greatly enlarged the therapeutic possibilities of these facilities.

Recent advances in the clinical aspects of climatic physiology [4] are furnishing statistical proof for suppositions which have persisted since the days of Hippocrates. It has long been known that the mean environmental temperature affects the energy level of populations [5] and that meteorologic strain influences the course of disease.[6] In general, the warmth of tropical and sub-tropical regions tends to be debilitating. The evidence now accumulating suggests that this may depress vitality and secondarily affect susceptibility to infection. On the other hand, the more invigorating climate of the middle temperate zone autonomously augments activity and this brings in its wake a heightened incidence of degenerative and metabolic ailments. Thus climatic environment appears to have a sufficiently direct influence on the energetics of human behavior to make weather a factor of importance in the management of disease and the maintenance of health, especially that of those who have lost the physiologic resilience characteristic of youth.

Common to the experience of all physicians is the fact that when conservative treatment in the home environment fails, relocation of the patient may have health advantages attributable in part at least to the climatic factor. Temporary migration to a locality in which meteorological conditions are favorable may be sufficiently restorative to reestablish tolerance to environmental strains previously disabling. How much of the effect is due to the therapeutic advantages of change of scene, which are recognized universally, is a question of more academic than practical importance.

The mineral waters and peloids which have been used most extensively for therapeutic purposes in recent times are those found in geographic regions endowed by nature with scenic beauty, a favorable temperature and altitude, an abundance of sunshine, and relative freedom from storms. Mineral waters rank among the most ancient remedies used for the alleviation of the disabling concomitants of chronic disease. They have been held in high esteem by all races of mankind in all ages. Empirical evidence in support of their value has been recorded in hundreds of papers and monographs. What proportion of the sum total of the effect of spa therapy is attributable to the mineral waters per se, is also open to speculation. Climatic factors play a part, as does the hygienic regimen with which spa therapy is associated traditionally.

Chronic disease is usually accompanied by diminution in physical activity, which may have either an organic or psychogenic basis. This in itself may then give rise to sufficient deterioration in general fitness and vitality to affect adversely the course of the primary ailment. The resumption of self-sustaining activities by the ambulant chronically ill patient may be expedited significantly by temporary residence in a health resort or spa. Change in scene and freedom from the stress of home or occupational responsibilities is one of the major components of the so-called spa or health resort regimen. When this is combined with dietary control and a balanced program of rest, prescribed exercise increasing progressively in severity, and healthful diversional activities, the machinery of the body as a whole soon operates at a level conducive to maximal restoration of residual function. Association with others actively interested in rehabilitation and committed to a way of life believed to be essential to its attainment, is also of unquestioned value.

Mineral waters are prescribed in the form of baths, packs, inhalation or "drinking cures." Their temperature, mineralization and gaseous constituents depend on the geologic formations and strata through which they flow and the depth from which they rise. Their physicochemical properties determine their therapeutic use. The manner in which they are administered influences their physiologic effects. External applications are used primarily either for their hydrothermic or hydrokinetic influence. Modern equipment permits precise control of both temperature and pressure of the waters used. Peloids provide an excellent medium for conduction heating because of their plasticity, low specific heat, and poor conductivity. They cool slowly and temperatures up to 50 C. are tolerated. Frequently spas have available some forms of classical physical therapy. Others also provide occupational therapy. The judicious application of natural resources of therapeutic value combined with other physical remedies as indicated, retreat under medical supervision, and life in a healthful environment, must, in the aggregate, form a powerful triad of adjuvants, useful in the management of the chronically ill patient.

The Committee on American Health Resorts of the Council on Physical Medicine and Rehabilitation of the American Medical Association assists the physician by listing climatic and mineral spring facilities believed to have value in the treatment of the sick and disabled. To be accepted for listing a health resort must be located where natural healing agents or special climatic conditions are found, be operated under medical supervision, have a physical plant suitable for administration of treatment with the natural agents, and have available accessory forms of physical medicine under proper supervision. The files of the Council contain information about the chemical composition of many mineral waters now used therapeutically, the qualifications of medical and technical personnel affiliated with health resorts, the type of accommodations available, the average patient load, the conditions treated and the season of year considered most advantageous to the patient from a climatic viewpoint. The Council's "Handbook of Physical Medicine and Rehabilitation" [7] classifies the mineral waters, presents the scientific basis of health resort therapy, and discusses indications for its use. A health resort or spa selected from the list recommended by the Committee assures the referring physician that the patient will receive supervision from a colleague versed in all aspects of the special forms of therapy utilized in such institutions. He will be certain that treatment is administered only by specially trained technical assistants who work under medical supervision. Direct referral is the best procedure to follow.

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[1] Fitch, W. E.: Mineral Waters of the United States and American Spas, Philadelphia, Lea & Febiger, 1927.

[2] Kovacs, R.: The Problem of the American Spas, J. A. M. A. **127**: 977 (April 14) 1945. Krusen, F. H.: The Place of Health Resorts in Rehabilitation Following Injuries, J. A. M. A. **125**: 905 (July 29) 1944.

[3] Rusk, H. A.: Rehabilitation, Handbook of Physical Medicine and Rehabilitation, Philadelphia, The Blakiston Company, 1950, pp. 484-502.

[4] Mills, C. A.: Climatic and Weather Effects with Special Reference to Respiratory Diseases, Radiation and Climatic Therapy of Chronic Pulmonary Diseases, Baltimore, The Williams & Wilkins Company, 1944, pp. 145-162; Medical Climatology, Springfield, Charles C Thomas, 1939.

[5] Huntington, E.: Mainsprings of Civilization, New York, John Wiley & Sons, Inc., 1945.

[6] Petersen, W. F.: Weather and Biochemical Variability, Arch. Biochem. **1**: 269 (Dec.) 1942.

[7] McClellan, W. S., and Jung, F. T.: Climatology and Health Resorts, Handbook of Physical Medicine and Rehabilitation, Philadelphia, The Blakiston Company, 1950, pp. 519-532.

A full exchange of information about the patient by the family doctor and the health resort specialist insures continuity of control and avoids duplication of laboratory studies deemed essential to proper management.

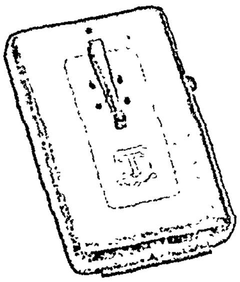
Increasing interest in chronic disease as a primary medical problem in an aging population indicates that new types of medical service must be made more generally available if residual functional capacities are to be maintained at levels capable of meeting the stresses of daily living at all economic levels. Increased utilization of the nation's natural climatic and mineral water resources is one method of attaining this objective. The possibilities inherent in their incorporation in an expanding system of rehabilitation centers challenges the imagination and should be investigated by all who are confronted with the problem of evolving a rational method of meeting the health needs of the ambulant chronically ill patient.

The Council on Physical Medicine and Rehabilitation has authorized publication of the following reports.

Howard A. Carter, *Secretary.*

TONAMIC HEARING AID, MODEL 50, ACCEPTED

Manufacturer: Tonamic, Inc., 12 Russell St., Everett 49, Mass.



Tonamic Hearing Aid, Model 50

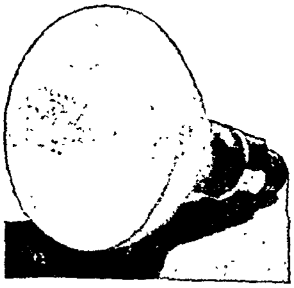
The Tonamic Hearing Aid, Model 50, is an electric hearing aid of conventional design. Excluding projections, the case measures 90 by 58 by 20 mm., and without batteries the device weighs 85 gm.

Evidence from sources acceptable to the Council indicated that this device was satisfactory in construction and performance. The Council on Physical Medicine and Rehabilitation voted to include the Tonamic Hearing Aid, Model 50, in its list of accepted devices.

SYLVANIA SUN LAMP, MODEL RS, ACCEPTED

Manufacturer: Sylvania Electric Products, Inc., 60 Boston St., Salem, Mass.

The Sylvania Sun Lamp, Model RS, is a completely self-contained bulb which can be screwed into the standard light-socket. No transformer or reflector is needed, as both are contained within the bulb. It will not operate on direct current, but requires 110 to 125 volts of 50 to 60-cycle alternating current. It draws 275 watts. The firm states that, at an average exposure of 5 to 30 minutes each, it should furnish about 600 applications. After an average of 600 applications, even though the lamp may still light, the ultraviolet output is likely to have become so low that replacement with a new bulb is advisable. A package of six lamps measures 28 by 69 by 46 cm. (11 by 27 by 18 in.) and weighs 6 kg. (13 lb.).



Sylvania Sun Lamp, Model RS

Evidence from sources acceptable to the Council indicated that this lamp satisfied the published minimum requirements of the Council for the acceptance of sun lamps. The Council points out that ultraviolet radiation is effective only on skin that is actually exposed, that the radiation from sun lamps is not recommended as illumination for reading, and that the eyes, if not protected from such radiation by goggles, should at least be kept closed. The Council on Physical Medicine and Rehabilitation voted to include the Sylvania Sun Lamp, Model RS, in its list of accepted devices.

SANDERS OSCILLATING BED (VASOSCILLATOR) ACCEPTED

Manufacturer: American Hospital Supply Corporation, 2020 Ridge Ave., Evanston, Ill.

The Sanders Oscillating Bed was originally designed to aid the circulation in peripheral vascular disease and was accepted by the Council for this purpose. The apparatus is described in an announcement of acceptance published in The Journal Nov. 26, 1938. In May, 1950, the manufacturer requested further consideration of the apparatus as a means for giving artificial respiration.

The bed measures 78 by 91 by 210 cm. (30¼ by 36 by 82½ in.) in height, width, and length, respectively, and weighs 158 kg. (389 lb.). Crated for shipment it measures 88 by 109 by 223 cm. (34¾ by 43 by 88 in.) and weighs 240 kg. (530 lb.). The foreign shipping weight is 309 kg. (680 lb.). The accessories included in the weights given are as follows: Electric cord from motor to outlet (complete with on-and-off switch and plug), crank handle to adjust spring bottom to different positions, and mattress stops for head and foot ends. The motor is driven by 60-cycle alternating current at 110 volts and draws about 300 watts.

Sanders Oscillating Bed (Vasoscillator)

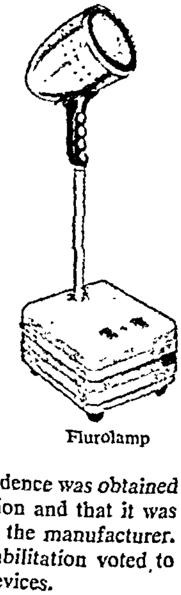
Evidence submitted to the Council indicated that the apparatus could be used for limited periods of time in giving artificial respiration, for instance, to patients with poliomyelitis, provided the patient were not in a stage where muscular tenderness made the motion intolerable. The Council on Physical Medicine and Rehabilitation voted to recognize the potential usefulness of the Vasoscillator as an aid to respiration in poliomyelitis and similar conditions in addition to its previously recognized usefulness in circulatory diseases, with the understanding that the manufacturer will not represent it as complete equipment for handling all types of respiratory failure.

FLUROLAMP ACCEPTED

Manufacturer: Hanovia Chemical & Mfg. Co., Special Products Division, 100 Chestnut St., Newark 5, N. J.

The Flurolamp is a source of ultraviolet radiation designed for use in diagnosis. The radiation is also described as Black Light. It closely resembles Wood's Light, which is filtered through Wood glass containing nickel oxide, but differs in that the radiation of the Flurolamp is filtered through a glass called Ultra 5872, which is heat-resisting and transmits less of the shorter ultraviolet radiation. The Flurolamp is provided with a roughly parabolic reflector and is mounted on a low stand which can be set on a table and which contains the switch and other necessary electrical apparatus. The housing of the lamp bears a handle by which it can easily be lifted off the stand and moved and manipulated freely.

Unpacked, the article measures 52.5 by 30 by 20 cm. (21 by 12 by 8 in.). Packed for shipment it measures 34 by 38 by 39 cm. (13½ by 22¾ by 15½ in.) and weighs 11.3 kg. (25 lb.). For operation it requires a 60 cycle alternating current at 110 volts.



Flurolamp

From sources acceptable to the Council, evidence was obtained that this device was of satisfactory construction and that it was useful for diagnostic purposes as claimed by the manufacturer. The Council on Physical Medicine and Rehabilitation voted to include the Flurolamp in its list of accepted devices.

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HORMONAL CEREBRAL VASOPRESSOR SUBSTANCE

Essential hypertension is believed to be of multiple etiology, involving neurogenic, cardiovascular, endocrine, and renal factors. Binet and Burstein [1] demonstrated that centripetal stimulation of the vagus in a dog introduces into the blood of the animal a vasoconstrictor substance which is manifested by a rise in pressure in the blood vessels of the denervated leg of the dog perfused with its own blood or blood from another dog. Injection of "prosympal," or 883F (diethylamino-methyl-3-benzodioxane), a synthetic sympathicolytic drug, did not reverse the peripheral vasoconstriction in the same dog. They argued that, if the rise in pressure following centripetal stimulation of the vagus depended solely on discharge of epinephrine, the increased pressure in the blood vessels of the denervated leg should have been abolished by the action of the sympathicolytic drug. This irreversibility of the peripheral constriction by a sympathicolytic drug demonstrates the presence of a vasopressor substance of cerebral origin.

At least three pressor substances are known to originate in nerve tissues, according to Taylor, Page, and Corcoran.[2] These are epinephrine, arterenol, and vasopressin (pitressin®). These authors believe they have demonstrated the existence of still another pressor substance. They have isolated in a dog the circulation of the central nervous system cephalad to the fifth cervical vertebra and perfused the animal with the blood of a donor dog. The effluent jugular blood of the head of dog A was returned by anastomosis to the jugular vein of dog B. Both vagi of dog A were cut in the neck, and the central end of one or other or both vagi of dog A were stimulated with a sinusoidal current of an intensity of about 50 ma. This resulted in a slow rise of arterial pressure in dog B, which slowly disappeared after the stimulation was stopped. In still another experiment, the spinal cord distal to the sixth cervical segment was exposed by laminectomy and was pithed. Test doses of epinephrine and arterenol were given, after which the vagi were stimulated. This stimulation caused a gradual rise in arterial pressure which persisted for five to 10 minutes after stimulation was stopped. Tetraethylammonium chloride in doses of 5 mg. per kilogram augmented the pressor action of epinephrine and arterenol. Administration of piperoxan hydrochloride during the periods of vagus stimulation resulted in augmentation of the pressor response. Reubi [3] demonstrated that 1-hydrazinophthalazine (C-5968) is an effective hypotensor and a renal vasodilator. This has been confirmed by Page and McCubbin and by Schroeder. The drug, according to these investigators, causes profound and prolonged lowering of arterial pressure in dogs with chronic neurogenic and renal hypertension. Taylor and associates [2] found this substance effective in widely differing forms of hypertensive disease. They also found, in their experiments with vagus stimulation in the dog, that three successive intravenous injections of 1-hydrazinophthalazine in doses of 1 mg. per kilogram abolished the pressor effect of the centripetal vagus stimulation.

Rapport and associates [4] demonstrated a pressor and vasoconstrictor substance formed during the clotting of blood. Because it is derived from serum and because its action is that of constriction, they called it serotonin. Taylor and co-workers believe that the substance they have demonstrated by vagal stimulation is of cerebral origin and that it has a common property with serotonin. They feel that participation in essential hypertension of a pressor substance of cerebral origin, unaffected by agents that wholly block adequate doses of epinephrine and arterenol, would explain some of the paradoxes of our knowledge of the altered physiology of this disease. This might explain, for example, the fact that patients with so-called neurogenic hypertension are frequently not benefited by extensive lumbodorsal sympathectomy, whereas, were their disease dependent only on vasomotor mechanisms, the results should be good. Since 1-hydrazinophthalazine is active in etiologically distinct types of hypertension and since it acts by inhibiting a cerebral vasopressor substance, the cerebral vasopressor substance may participate in varying degrees in more than one form of hypertensive disease.

These observations suggest that the brain can, on appropriate stimulation, act as an endocrine organ and release a hormonal pressor substance into the blood. The conclusion is in accord with the view held by Claude Bernard that every organ is in some respect endocrine.

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1. Binet, L., and Burstein, M.: Sur le pouvoir vasoconstricteur du sang artériel après excitation centripète du nerf vague chez le chien, Compt. Rend. Soc. biol. **143**: 1344 (Oct.) 1949. Passage dans le sang d'une substance vasoconstrictrice d'origine céphalique après excitation centripète d'un nerf vague chez le chien, ibid. **143**: 1347 (Oct.) 1949.
2. Taylor, R. D.; Page, I. H., and Corcoran, A. C.: A Hormonal Neurogenic Vasopressor Mechanism, Arch. Int. Med. **88**: 1 (July) 1951.
3. Reubi, F.: Influence de quelques vasodilatateurs périphériques sur le flux sanguin rénal, Helvet. med. acta **16**: 297 (Sept.) 1949.
4. Rapport, M. M.; Green, A. A., and Page, I. H.: Crystalline Serotonin, Science **108**: 329 (Sept. 24) 1948.

CHONDROITIN SULFATE

Chondroitin sulfate is one of the important constituents of cartilage, since it is believed by many in the field that this tissue is made up mainly of chondroitin sulfate and the insoluble protein collagen. Chondroitin sulfate is a nonreducing polysaccharide composed of equal parts of an amino sugar and acetic, sulfuric, and glucuronic acids. The sulfuric acid is present in an esterified form. Dziewiatkowski[1] showed that administration of radioactive sulfur in the form of sulfate caused a deposition of radioactivity in the knee-joint cartilage of weanling rats. In addition the radioactivity was concentrated in the chondroitin sulfate isolated from the cartilage.

More recently Dziewiatowski[2] reported the effect of thiouracil and thyroxine in the deposition of radioactive sulfate sulfur in the knee-joint cartilage of rats. He found that pretreating the animals with thiouracil reduced the uptake of radioactive sulfur in the cartilage of these animals. On the other hand, the effect of thiouracil in decreasing the deposition of sulfur in cartilage could be counteracted by the administration of thyroxine. Also, through the use of isotopes, the approximate mass of chondroitin sulfate deposited in the knee joints of the rats in 24 hours could be calculated. The period chosen in this work was between the 7th and 8th day of life in the suckling rat. Approximately 0.134 gm. of chondroitin sulfate was formed per 100 gm. of cartilage during this period. This is probably the first instance in which the actual rate of formation of chondroitin sulfate has been determined. It is of importance to obtain more information concerning all phases of the origin and degradation of this most interesting mucopolysaccharide, since it is widely distributed in tissue and probably undergoes many changes during various pathological states.

CONTRIBUTORS TO THE AMERICAN MEDICAL EDUCATION FOUNDATION

American medicine, industry, labor, agriculture, and many other groups are presently joined in a movement to forge a practical program for the support of medical education. The members of the medical profession are making their contributions through the American Medical Education Foundation. The money thus collected is channeled into the National Fund for Medical Education, which distributes these funds, along with the donations of others, to the nation's 79 medical schools.

The contributions of many organizations interested in the future of medical education have done much to get this movement started. However, of equally great import have been the individual gifts by American physicians. To these individuals, the Directors of the American Medical Education Foundation extend gratitude—for their monetary contributions and for the example they are setting for others.

Elsewhere in this issue (page 1329) is published a list of those who have contributed to the American Medical Education Foundation as of July 5, 1951. The listing is by states, with the total contributors from each state indicated. Organizations and lay persons making contributions are also named. Additional lists of donors will be printed from time to time in THE JOURNAL.

A NEW BACTERIAL VITAMIN

During the past decade, microbial mutants have proved valuable tools for study of the mechanisms of chemotherapeutic action and of the biochemical alterations responsible for drug resistance in micro-organisms. Recent experiments by Davis illustrate the type of data that may be obtained from such studies. Nutritionally deficient mutants of Escherichia coli were isolated by an ingenious procedure[1] based on the fact that, while penicillin will destroy actively growing bacteria, it has little effect on resting organisms.[2] Mutants produced by exposing colonies of Esch. coli to ultraviolet irradiation were cultivated on a penicillin-containing minimal medium in which glucose, lactose, ammonia, and sulfur were the sole sources of carbon, nitrogen, and sulfur. Amino-acid-requiring mutants remained dormant and were unaffected by the penicillin but were rendered as sensitive as the nonmutants when the amino acids essential to their growth were added. Among the mutants isolated was one which grew slowly on a mixture containing tyrosine, phenylalanine, tryptophane, and paraaminobenzoic acid.[3] Growth of this mutant was accelerated by the addition of either an excess of paraaminobenzoic acid or of shikimic acid, previously shown to be precursor of the above four metabolites. It was postulated, therefore, that the mutant required a fifth metabolite which could be readily formed from shikimic acid and, less readily, from paraaminobenzoic acid. A substance with the activity of the postulated metabolite was isolated from culture filtrates of parent wild type Esch. coli and was subsequently shown by paper chromatography and by biological assay to be identical with the aromatic compound parahydroxybenzoic acid. The high order of activity of this compound led Davis to suggest that it be considered as a bacterial vitamin.

Preliminary studies have shown that parahydroxybenzoic acid completely overcomes the inhibitory effects of excessive amounts of paraaminobenzoic acid on a wild type Esch. coli in a 1:200 ratio and partially overcomes the inhibitory effect of the analogue, 4,4′-dihydroxydiphenyl sulfone. However, neither this latter compound nor paraaminobenzoic acid will produce complete inhibition of parahydroxybenzoic acid unless traces of l-aspartic acid are added, although high concentrations of aspartic acid alone do not affect the growth of the bacteria.[4] It has further been shown that parahydroxybenzoic acid reverses the static effect of paraaminobenzoic acid on Rickettsia under certain circumstances.[5] These reports are of considerable theoretical and practical interest, since they indicate that the mechanism of the chemotherapeutic action of paraaminobenzoic acid against the rickettsial infections may be by competitive inhibition and they suggest the importance of testing the chemotherapeutic action of other analogues of the newly discovered vitamin.

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[1] Dziewiatkowski, D. D.; Benesch, R. E., and Benesch, R.: J. Biol. Chem. **178**: 931, 1949. Dziewiatkowski, D. D.: ibid. **189**: 187, 1951.

[2] Dziewiatkowski, D. D.: J. Biol. Chem. **189**: 717, 1951.

[1] Davis, B. D.: J. Am. Chem. Soc. **70**: 4267 (Dec.) 1948. Lederberg, J., and Zinder, N.: ibid. **70**: 4268 (Dec.) 1948.

[2] Hobby, G. L., and Dawson, M. H.: Proc. Soc. Exper. Biol. & Med. **56**: 181 (June) 1944.

[3] Davis, B. D.: Nature **166**: 1120 (Dec. 30) 1950.

[4] Davis, B. D.: Federation Proc. **10**: 406 (March) 1951.

[5] Snyder, C., and Davis, B. D.: Federation Proc. **10**: 419 (March) 1951.

ORGANIZATION SECTION

ABSTRACT OF MINUTES OF MEETINGS OF BOARD OF TRUSTEES IN ATLANTIC CITY, N. J., JUNE 8-14, 1951

APPOINTMENTS

The following appointments were made by the Board of Trustees:

Dr. Carl M. Peterson to attend the Tenth International Congress of Industrial Medicine in Lisbon, Portugal, Sept. 9-15, 1951, to become a member of the United States delegation on the Commission Internationale Permanente pour le Medecin du Travail, to serve on the panel on social and occupational health of the World Health Organization and to confer with members of the Occupational Health Committee of the British Medical Association and officers of the Association of Industrial Medical Officers on the report issued by the Committeee on Enquiry on Industrial Health Services (Dale Committee).

Dr. Ray O. Bjork of Butte, Mont., to succeed Dr. Glenville Giddings, who is ineligible for reappointment, for a term of four years on the Joint Committee on Health Problems in Education of the American Medical Association and the National Education Association.

Dr. Truman Terrell, Fort Worth, Texas, as the fifth member of the Committee on Public Relations Policy of the American Medical Association.

Dr. W. W. Bauer to the executive committee of the National Committee for Traffic Safety.

Dr. Howard Gray and Dr. Donald Smelzer to succeed themselves for a three-year term on the Commission for the Improvement of the Care of the Patient.

Dr. T. P. Murdock to serve as special adviser to the Committee on Immunization of the National Foundation for Infantile Paralysis, Inc.

Dr. Donald Dukelow to serve as a member of the Elizabeth S. Prentiss Award Committee for 1951 of the Cleveland Health Museum to recommend to the trustees of the Museum a recipient for the 1951 Prentiss Award in Health Education.

Dr. George F. Lull to membership on the National Advisory Board of the All-American Conference to Combat Communism of the American Legion.

Dr. Austin Smith to the Committee on Consultants for the Study of the Indexes to Medical Literature of the Army Medical Library.

Dr. Richard L. Meiling to the Council on National Emergency Medical Service as of July 1.

Dr. Oscar B. Hunter as Chairman of the Committee to Entertain Foreign Guests at annual and clinical sessions of the Association.

Dr. L. W. Larson on the Medical Policies and Procedures Committee of the American National Red Cross Blood Program.

COMMITTEE ON MEDICAL MOTION PICTURES

An appropriation was authorized by the Board to permit of a preliminary investigation to be conducted by the Committee on Medical Motion Pictures to ascertain a satisfactory method of determining the relative effectiveness of motion pictures in medical teaching.

FOOD LAW INSTITUTE

Authorization was given to Dr. James R. Wilson, Secretary of the Committee on Foods and Nutrition, to accept the invitation from the Food Law Institute to become public trustee of that organization.

SCIENTIFIC EXHIBITS

The following invitations to exhibit at meetings were accepted by the Board:

Michigan State Medical Society, Grand Rapids, Sept. 26-28.

American Dental Association, Washington, D. C., Oct. 15-18 (exhibit and motion picture).

CIVIL DEFENSE CONFERENCE

The Board of Trustees approved a request that arrangements be made for the holding of a meeting on civil defense in the near future.

CLINICAL SESSIONS

Dr. Walter Scott was appointed Chairman of the Local Committee on Arrangements for the Clinical Session of the Association to be held in Los Angeles, Dec. 4-7, 1951.

Miami was selected as the place for the 1954 Clinical Session of the American Medical Association.

RADIO BROADCASTING AND TELEVISION

The Board approved acceptance of the invitation from President Truman's Committee on Accident Prevention, a subsidiary of the Department of Labor, to cooperate in a documentary broadcast on accident prevention.

Authorization was given for the holding of a conference in the early fall of 1951 of representatives of national television agencies to explore the educational implications and possibilities of television.

The Board also voted that congratulations be sent to the National Broadcasting Company on the occasion of its 25th anniversary.

"THE KEY TO PEACE"

The Board authorized sending the book "The Key to Peace," by Clarence Manion, to all members of the House of Delegates.

NATIONAL FIRE PROTECTION ASSOCIATION

The continued membership of the American Medical Association in the National Fire Protection Association was approved by the Board.

NATIONAL FOUNDATION FOR INFANTILE PARALYSIS, INC.

The Board voted to endorse a proposal from the National Foundation for Infantile Paralysis, Inc., which would further the cooperation between the chapters of the Foundation and organized medicine. A letter on this subject is being sent to the secretaries of all state medical societies.

INTERNATIONAL POLIOMYELITIS CONGRESS

The use of the name of the American Medical Association as an endorser of the Second International Poliomyelitis Congress, to be held in Copenhagen, Sept. 3-7, 1951, was approved by the Board.

Dr. Austin Smith was selected as one of the representatives of the association to attend the Congress; the other delegate will be chosen at a later date.

ALL-AMERICAN CONFERENCE TO COMBAT COMMUNISM

A contribution was made by the Board for the furtherance of the work of the American Legion's All-American Conference to Combat Communism.

CONFERENCE OF EDITORS OF STATE MEDICAL JOURNALS

The Board authorized the holding of a conference of editors of state medical journals at a time to be arranged by the Secretary and General Manager and the Advisory Committee to the State Journal Advertising Bureau.

REORGANIZATION OF BOARD

Following the adjournment of the House of Delegates on Thursday, June 14, the Board of Trustees reorganized and elected the following officers, committees and representatives:

Board of Trustees: Dr. Dwight H. Murray, Chairman; Dr. Gunnar Gundersen, Vice Chairman, and Dr. E. S. Hamilton, Secretary.

Executive and Finance Committees: Dr. Gunnar Gundersen, Dr. E. S. Hamilton and Dr. W. B. Martin.

Committee on Scientific Exhibit: Dr. E. J. McCormick, Chairman; Dr. L. W. Larson, and Dr. T. P. Murdock.

Representative on Council on Medical Service: Dr. David B. Allman.

Representative on Council on Industrial Health: Dr. E. J. McCormick.

Representative on Committee on Rural Health: Dr. L. W. Larson.

The Board of Trustees considered several other matters presented to it and the action taken on these will be found in its supplementary reports in the *Proceedings* of the House of Delegates (THE JOURNAL, June 30 and July 7, 1951).

CONTRIBUTORS TO THE AMERICAN MEDICAL EDUCATION FOUNDATION

Following are the names of all individuals and organizations who have contributed to the American Medical Education Foundation as of July 1, 1951.

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ORGANIZATIONS

- American Medical Association
- Woman's Auxiliary to the American Medical Association
- California Medical Association
- South Carolina Medical Association
- West Virginia State Medical Society
- Medical Society of Virginia
- American College of Radiology
- Mayo Foundation for Medical Education and Research
- Alumni Association of the Medical College of Syracuse University
- Medical Economics, Inc.
- W. B. Saunders Co.
- Jefferson County (Iowa) Medical Society
- Flathead County (Montana) Medical Society
- Lake Region (North Dakota) Clinic
- Greenbrier Valley (West Virginia) Medical Society

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- Joseph E. Richmond, Brownfield, Maine
- Richard J. Kester, 1106 Spruce St., Philadelphia
- Preston H. Fox, 7016 North Wolcott Ave., Chicago
- Jewel Whelan, 535 N. Dearborn St., Chicago

MEDICAL LEGISLATION

FEDERAL

Armed Forces Reserve Act of 1951

H. R. 4667, introduced by Representative Brooks of Louisiana, proposes to reorganize the reserve components of the Armed Forces. This bill resulted from the demand of the House Armed Service Committee for a better reserve program. It was submitted by the Defense Department and proposes to rewrite the laws pertaining to the reserve programs of the military services. In the recently enacted Public Law No. 51 (amending the Selective Service Act), it is contemplated that approximately 850,000 persons will enter the military services annually and that eventually a like number will complete active service annually. Persons completing active service will be required to continue in a reserve status for a combined service period of eight years. This proposed legislation would establish, within the seven official reserve components, three groups, which would be called to duty in the following order, depending on the nature of the emergency: (1) ready reserve, (2) stand-by reserve, and (3) retired reserve. Two American Medical Association Councils are interested in the provisions of this legislation; the Council on National Emergency Medical Service, because of liability of physicians to serve, and the Council on Medical Service, because of provisions dealing with medical care and periodic examinations for the contemplated large reserve force.

Federal Aid to Medical Education

Senator Hill of Alabama introduced an amendment to S. 337, which would amend the Public Health Service Act and the Vocational Education Act of 1946, to provide an emergency five-year program of grants and scholarships for education in the fields of medicine, osteopathy, dentistry, dental hygiene, public health, and nursing. The declaration of policy in S. 337 states that the five-year emergency program proposed is essential to meet "immediate and prospective requirements of the Armed Forces. . . ." This amendment would add the words "and the Veterans Administration" after the words "Armed Forces." The amendment was not referred to a committee but will be considered on the floor in the event S. 337 is acted on by the Senate membership.

MEDICAL NEWS

CALIFORNIA

Gold Headed Cane Ceremony.—The 14th Ceremony of the Gold-headed Cane at the University of California School of Medicine, San Francisco, was held June 5. The award is made annually to the outstanding senior medical student chosen by his fellow students and by faculty members for having in greatest measure the qualities of "a true physician" and for showing "the greatest interest in the care of his patients during the clinical year." An eminent physician is selected to give an address on the occasion, and he too receives a gold-headed cane. The winner of the honor in 1951 was Charles J. Carman, while John Lewis Linville and George W. Smith received honorable mention. The guest speaker was Dr. Roger Irving Lee, Boston, a former president of the American College of Physicians and of the American Medical Association. The award, a yew-wood cane with an engraved golden handle, is modeled after the famous gold-headed cane which was immortalized in Macmichael's book and which now reposes in the Royal College of Physicians in London. The original cane passed successively from its first owner, Radcliffe, in the 15th century, through the hands of other illustrious British physicians. The gold-headed cane of California passes in like manner from winner to winner, and a second cane from speaker to speaker. The ceremony was first inaugurated in 1939 by Dr. William J. Kerr, professor of medicine and chairman of the division of medicine.

COLORADO

Honor Five Fifty-Year Practitioners.—Five San Juan Basin physicians, whose combined service to the people of southwestern Colorado totals 250 years, were honored June 2 by the San Juan Medical Society at a testimonial banquet in Durango. The five physicians are Drs. Royal W. Calkins, Cortez; Carl Lefforge, Ignacio; Jay R. Trotter, Mancos, and Wordsworth M. Elliott and Benjamin J. Ochsner, both of Durango. A bronze plaque was presented to each of the men honored.

ILLINOIS

Blumberg Memorial Blood Bank.—The Jacob Blumberg Memorial Blood Bank of the Lake County Medical Society has been organized to supply all the hospitals in Lake County. Organization of the blood bank was aided by a gift of $10,000 from the Blumberg family of Waukegan. Families in the county are signed up as a unit with the promise that one member of the family will give one pint of blood when requested by the bank. In return for this each family is guaranteed all the blood it may need at any time without the necessity of replacing the blood or paying for it. Only the usual hospital service charge will be made. Blood is now distributed to each hospital in the county and is available at all times. The distribution of blood to the hospitals is carried out by the sheriff's office, which, in addition, has facilities always available to carry blood for emergencies.

Chicago

Society News.—At the May meeting of the Chicago Neurological Society in Manteno the following officers were elected for the coming year: Dr. John Martin, president; Dr. Hugh T. Carmichael, vice president; Dr. Joseph A. Luhan, councilor, and Dr. Leo A. Kaplan, secretary.

Personals.—Dr. Nathaniel S. Apter has been promoted to the rank of associate professor of psychiatry at the University of Chicago.——Robert M. Cunningham Jr., formerly managing editor of *Hygeia* and since 1945 managing editor of *Modern Hospital*, has been appointed editor of the latter publication.

Hektoen Memorial Fund.—Creation of this fund at the Hektoen Institute for Medical Research was announced July 7 by chairman of the board of trustees, Dr. Karl A. Meyer. An initial $5,000 contribution has been made by the institute and will be supplemented by friends. The fund will be used for research in immunology.

Fellowship Available.—The Jessie Horton Koessler Fellowship of the Institute of Medicine of Chicago, for the aid of research in biochemistry, physiology, bacteriology, or pathology, will be available on Nov. 1. The stipend is $500 a year with the possibility of renewal for one or two years. Only such applications will be considered as are approved by the head of a department in the fields mentioned or by the director of a research institute or laboratory in Chicago, and which stipulate that the recipient of the fellowship shall be given adequate facilities for carrying out the proposed research. Applications should be sent up to Sept. 1 in quadruplicate to Dr. Paul R. Cannon, Chairman, Committee on the Jessie Horton Koessler Fund, 950 East 59th St., Chicago 37. Application should be made by letter.

INDIANA

Summer Conference Programs.—The departments of medicine of Indiana University Medical Center, Indianapolis General Hospital and the Veterans Administration Hospital are sponsoring conference programs during the summer months. They are presented each Friday evening at 8 p. m. in the classroom of the x-ray department of the Medical Center in Indianapolis, with members of the staffs of the three hospitals alternating in presenting the program.

University Inaugurates Quarter System.—The quarter system for senior medical students at Indiana University School of Medicine, Indianapolis, was inaugurated in June with about one-fourth of the class remaining on the campus during the summer months. Each senior elects the three quarters which he attends and during the fourth quarter is free to take special work or to accept income-producing employment. The plan, enthusiastically accepted by the students, also meets the teaching problem resulting from the large classes in limited classroom, laboratory, and clinic facilities.

IOWA

Dr. Tidrick to Head Surgery Department.—Dr. Robert T. Tidrick, professor of surgery at the State University of Iowa College of Medicine, Iowa City, since 1949, has been appointed chairman of the department effective Sept. 1, succeeding Dr. Nathan A. Womack, who retired recently. Dr. Tidrick has been on the staff of the college of medicine since 1938, successively as assistant resident in surgery, instructor in orthopedic pathology, assistant instructor in surgery, and as assistant, associate, and full-time professor of surgery.

MASSACHUSETTS

Dr. Hawn Succeeds Dr. Wolbach at Harvard.—Dr. Clinton Van Zandt Hawn of Cooperstown, N. Y., has been appointed associate professor of pathology in the Harvard Medical School and pathologist-in-chief of Peter Bent Brigham Hospital, and will assume his new duties in September. Dr. Hawn is now serving as assistant professor of pathology at Columbia University College of Physicians and Surgeons, as pathologist to the Mary Imogene Bassett Hospital in Cooperstown, N. Y., and as director of the Otsego County Laboratories. The pathology department of the Peter Bent Brigham Hospital was created in 1913 by Dr. William T. Councilman, then Shattuck Professor at the Harvard Medical School, and Dr. Wolbach became its head in 1916. Since Dr. Wolbach's retirement in 1947, the department has been conducted by acting heads. As Dr. Wolbach's successor, Dr. Hawn will be the third Harvard scientist to serve as pathologist-in-chief of the Peter Bent Brigham Hospital.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

NEW JERSEY

Dr. Kendall Goes to Princeton.—Dr. Edward C. Kendall, emeritus professor at the Mayo Foundation in Rochester, Minn., has been appointed visiting professor of chemistry at Princeton University. Dr. Kendall was a joint recipient with Dr. Philip S. Hench of the Nobel Prize in 1950 for a program of research leading to the development of cortisone. He will join the staff of the James Forrestal Research Center, bringing with him a program aimed at clarifying the nature of the adrenal cortex.

Personals.—Dr. Hyman I. Goldstein, Camden, has been elected life-time medical historian of the New Jersey Gastroenterological Society. He is an honorary member of the gastroenterological societies of Italy and Belgium, and a correspondent member of the Cuban Society of Cancerology.——Dr. James M. Carlisle, medical director of Merck & Co., Inc., Rahway, since 1936, was awarded an honorary degree of doctor of laws in Dublin by the National University of Ireland.

NEVADA

Reno Surgical Society.—This society will hold its annual meeting August 23-25. The following speakers who will address the society on two different occasions are as follows:

John J. Davies, Baltimore, Use of Metals and Metalic Prosthesis in Surgery; Combined Anterior and Posterior Denervation.
Emile F. Holman, San Francisco, Surgical Experiences with Mediastinal Tumors; Surgical Experiences with the Operative Treatment of Portal Hypertension for the Relief of Hemorrhage and Ascites.
Francis L. Lederer, Chicago, Otolaryngology Today and Tomorrow; Misconceptions: Vertigo, Deafness and the Discharging Ear.
James B. McNaught, Denver, Pathology of the Breast; Pathology of Pulmonary Lesions.
Willis J. Potts, Chicago, Congenital Lesions of the Gastrointestinal Tract; Congenital Lesions of the Chest.
Juan A. del Regato, Colorado Springs, Colo., Radiological Treatment of Carcinoma of the Breast; Treatment of Carcinoma of the Lower Lip.
Herbert F. Traut, San Francisco, Advancements in Gynecology; Mechanisms of Endometrial Bleeding and Their Clinical Significance.

NEW YORK

Personal.—Dr. Henry W. Kaessler, Mount Vernon, is a district governor of Rotary International, world-wide service club organization, for 1951-1952. As governor he coordinates activities of the 56 Rotary Clubs in Bermuda and parts of New York which comprise the 257th Rotary District.

Conference on the Nucleus.—A conference entitled "The Chemistry and Physiology of the Nucleus" will be held at Brookhaven National Laboratory, Upton, Long Island, August 15-17. The conference will feature 18 speakers and five demonstrations. Each speech will be followed by a period for free discussion. Inquiries for reservations should be addressed to Biology Department, Brookhaven National Laboratory, Upton, L. I.

Pritchard Pavilion.—The medical-surgical building at St. Lawrence State Hospital, Ogdensburg, was named the Pritchard Pavilion and dedicated June 13 as a tribute to Dr. John A. Pritchard. Dr. Pritchard retired Jan. 1, 1950, after serving the state for almost half a century. He has been on the staffs of the Brooklyn, Willard, Kings Park, and Buffalo state hospitals. A memorial tablet was unveiled at the pavilion by his fellow workers.

New York City

Medical College Appointment.—Dr. Charles L. Fox Jr. has been appointed research associate in surgery with professorial rank at New York Medical College, Flower and Fifth Avenue Hospitals. Dr. Fox and Dr. James M. Winfield, professor of surgery at the institution, recently received a grant from the United States Public Health Service to support their research on electrolyte metabolism and for the study of improved methods of treating shock caused by burns and other trauma. New research laboratories have been built at New York Medical College, Flower and Fifth Avenue Hospitals for this work. Dr. Fox has been assistant professor of bacteriology at the Columbia University College of Physicians and Surgeons. In addition to his research work at the college, he will assist in teaching basic sciences.

TEXAS

Conference on Animal Diseases.—The Texas State Department of Health, the University of Texas, and Texas Agricultural and Mechanical College sponsored a conference on animal diseases transmissible to man in Austin, Texas, June 12-14. Over 175 were in attendance, including representatives from eight states and Hawaii. Topics discussed included rabies, encephalitis, poliomyelitis, Newcastle disease, conjunctivitis, ornithosis, histoplasmosis, coccidioidomycosis, anthrax, brucellosis, plague, typhus, Bullis fever, leptospirosis, protozoal and spirochetal diseases transmissible to man, Q fever, ringworm infections, and defense against biological warfare. The conference was so successful that plans are being made to make it an annual affair.

WEST VIRGINIA

Morgantown Selected for State Medical School.—An 80-acre tract of land adjacent to the Monongalia General Hospital near Morgantown has been selected by the board of governors of West Virginia University as the site of the new four-year school of medicine, dentistry, and nursing. The tract, donated by the Monongalia County Court, was formally accepted by the board at a meeting July 12 in Morgantown. It was indicated after the meeting that the first unit to be constructed would probably be a classroom building to cost about 2 million dollars. The Court also offered to convey to the board of governors without consideration the Monongalia County General Hospital and Nursing Home, but action on the acceptance of the offer was reserved by the board for future deliberation. In naming Morgantown as the location for the new school, Gov. Okey L. Patteson issued a 33-page statement setting forth his reasons for the selection of Morgantown as the site instead of placing the school at Huntington or Charleston. It is probable that arrangement with the Medical College of Virginia at Richmond for the acceptance of 20 of the 30 graduates each year from the two-year school at Morgantown will be continued until the opening of the four-year school. This arrangement, made several years ago, has worked satisfactorily assuring acceptance annually of two-thirds of the graduating class at West Virginia University's two-year school.

WISCONSIN

Community Honors Physician.—Over 3,000 friends attended the community celebration in Randolph June 16 honoring Dr. Arthur W. Jones, who had served the town for 50 years. The celebration included a parade of floats depicting phases of Dr. Jones' career.

Personal.—Dr. Gerard A. Fostvedt, Barron, gave an address entitled "Extemporaneous Prescription Writing Is Self Taught," before the joint Fifth District meeting of the National Association of Boards of Pharmacy and the American Association of Colleges of Pharmacy, held June 25-26 at Rapid City, S. D.

GENERAL

Study of Medical Care Plans.—The Health Information Foundation is undertaking a two-year study of methods of payment for medical and other health care. The analysis, the foundation says, "will bring out the advantages and shortcomings of various plans, and point the way toward further progress." A grant of $92,000 has been made to Columbia University to make the study.

Photographic Association Meeting.—The annual meeting of the Biological Photographic Association will be held Sept. 12-14 at the Hotel Kenmore, Boston. Typical subjects to be presented include: Improvements in Presentation of Material With Lantern Slides; Aids in Selecting Fields in Photomicrography; Successful Motion Pictures with Limited Equipment; and Photography of the Ocular Fundi. The annual salon, consisting of black-and-white and color prints, color transparencies and motion picture films, will be on exhibit. General chairman of the meeting is F. R. Harding, Children's Medical Center, 300 Longwood Ave., Boston 15.

Heart Association Research Applications.—The American Heart Association is accepting new research applications in cardiovascular and related fields for studies to be conducted during the academic year beginning in July, 1952. Applications for research fellowships and established investigatorships, two categories in which awards are made to individuals, may be submitted up to Sept. 15 of this year. Applications for research grants-in-aid to institutions, including grants for work in the basic sciences, may be filed up to Dec. 1. Information and forms may be obtained from the Medical Director, American Heart Association, 1775 Broadway, New York 19.

Society Elections.—At the annual meeting of the American College of Chest Physicians in Atlantic City, N. J., June 7-10 the following were among the officers elected for the coming year: Dr. Chevalier L. Jackson, Philadelphia, president; Dr. Andrew L. Banyai, Milwaukee, president-elect; Dr. Minas Joannides, Chicago, treasurer, and Dr. Charles K. Petter, Waukegan, Ill., assistant treasurer.——The officers of the New England Dermatological Society for the year 1951-1952 include Dr. G. Marshall Crawford, Brookline, Mass., president; Dr. Maurice J. Strauss, New Haven, Conn., vice president; Dr. Joseph Goodman, Boston, secretary, and Dr. Mildred L. Ryan, Brockton, Mass., treasurer.

National Medical Association Meeting.—The annual convention of the National Medical Association will be held in Philadelphia Aug. 20-24 with headquarters at the Philadelphia Municipal Auditorium and Convention Hall. Dr. Harold H. Walker, Nashville, Tenn., will give the president's address Tuesday at 9 a. m. He will be followed by Dr. Elmer L. Henderson, Louisville, Ky., Past President of the American Medical Association. The concluding speaker will be Dr. Michael O'Heeron, Baylor University College of Medicine, Houston, Texas, who will speak on "Postgraduate Training in the Small Hospital." The rest of the program is organized into section meetings. The Woman's Auxiliary will meet in conjunction with the association.

Scholarships in Cerebral Palsy.—A grant of $10,000 to continue a nationwide educational program for specialists in cerebral palsy has been made by Alpha Chi Omega, women's fraternity, to the National Society for Crippled Children and Adults, Chicago. The grant will make possible advanced study in the care and treatment of cerebral palsied children by specially selected physicians, therapists, and educators during the next two years. It brings to $35,000 the grants made by Alpha Chi Omega to the national society for training on the national level. In addition, $55,000 has been given for scholarships and training on the local level. Thus far, scholarship winners have been selected from 36 states, Hawaii, Canada, and Denmark. Since the beginning of the project, 54 physicians, therapists, and educators have received special training as a result of the Alpha Chi Omega grants.

Radiological Conference.—The Midsummer Radiological Conference of the Rocky Mountain Radiological Society will be held at the Shirley-Savoy Hotel, Denver, Aug. 9-11. Guest speakers who will address the sessions more than once include:

Robert R. Newell, San Francisco, Vision by X-Ray.
Howard P. Doub, Detroit, Cysts of the Mediastinum.
Paul C. Aebersold, Ph.D., Oak Ridge, Tenn., The United States Atomic Energy Program.
Frederick S. Webster, Lincoln, Neb., Growth Changes of the Extremity Associated with Tuberculosis of the Hip.
Hugh F. Hare, Boston, Intracranial Lesions which are Benefited by Radiation Treatment.

There will be a joint meeting with the Denver County Medical Society Thursday evening at 8 p. m. Dr. Hare will speak on "Lymphoid Tumors: A Ten to Twenty-year Follow-up," and Dr. Newell on "Medical Education in Japan." A symposium on "Double Contrast Study of the Colon" is scheduled for Friday evening under the chairmanship of Dr. Robert D. Moreton, Ft. Worth, Texas. Participants will be Drs. John T. Hartman, Harlingen, Texas; Charles W. Yates, Rosenberg, Texas; H. Milton Berg and John R. Williams, Bismarck, N. D.; and Dr. Moreton. The discussion will be opened by Dr. Stuart A. Patterson, Ft. Collins, Colo.

Dr. Gear Appointed Assistant Director General of WHO.—Retirement early next year of Sir Sahib Singh Sokhey of India as assistant director-general of the World Health Organization in charge of the Central Technical Services has brought about the appointment of Dr. Harry Sutherland Gear, deputy chief health officer of the Union of South Africa, to succeed him. Dr. Sokhey's retirement, which is due to his reaching the age limit, will not take effect until next April. However, to insure continuity in the work of the Department of Central Technical Services, Dr. Gear will join the WHO staff in September. From 1932 to 1935 Dr. Gear was in charge of the department of preventive medicine and medical statistics at the Lester Institute in Shanghai. From 1935 until the present he has been on the staff of the health department of the Union of South Africa, except from 1940 to 1944, when he served as senior medical officer with the South African British Armed Forces. In 1946 he was the delegate of the Union to the International Health Conference in New York, at which the creation of WHO was agreed upon. Later he represented his country at the First and Second World Health Assemblies. More recently he served as chairman of the WHO Executive Board for a one-year term. He also served as the board's representative at the Third and Fourth World Health Assemblies.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States in the weeks ended as indicated:

Area	July 21, 1951	July 14, 1951	July 22, 1950
New England States	30	20	14
Maine	2	1	1
New Hampshire	1	..	..
Vermont	1	..	2
[illegible]	17	17	7
[illegible]	..	..	..
[illegible]	9	2	4
Middle Atlantic States	61	44	93
New York	52	26	64
New Jersey	9	7	12
Pennsylvania *	..	11	17 †
East North Central States	152	111	113
Ohio	26	24	30
Indiana	8	8	10
Illinois	52	40	45
[illegible]	37	24	18
[illegible]	29	15	10
West North Central States	43	53	91
Minnesota	6	7	8
Iowa	17	12	42
Missouri *	..	13	7 †
North Dakota	1	4	..
South Dakota	1	2	4
Nebraska	9	7	11
Kansas	9	8	19
South Atlantic States	72	73	161
[illegible]	..	..	..
[illegible]	2	6	3
[illegible]	..	..	8
Virginia	9	4	76
West Virginia	2	3	11
North Carolina	4	7	23
South Carolina	4	3	22
Georgia	34	32	14
Florida	17	18	5
East South Central States	106	60	105
Kentucky	12	1	40
[illegible]	21	16	21
[illegible]	31	27	16
[illegible]	42	16	28
West North Central States	148	155	162
Arkansas	20	12	17
Louisiana	41	29	21
[illegible]	21	22	13
[illegible]	66	92	111
Mountain States	82	33	22
Montana	1	1	1
Idaho	3	..	..
Wyoming	8	2	7
Colorado	43	20	7
New Mexico	1	3	7
Arizona	7	5	..
Utah	19	2	..
Nevada	..	..	..
Pacific States	79	67	65
[illegible]	5	5	8
[illegible]	4	4	3
[illegible]	70	58	54
Alaska	(4)	..	..
Hawaii	(..)	..	..
United States	773	616	802

* No reports received.
† Figures not included in totals.

MEETINGS

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, The Homestead, Hot Springs, Va., Sept. 6-8. Dr. William F. Mengert, 2211 Oak Lawn Ave., Dallas, Texas, Secretary.

American Congress of Physical Medicine, Shirley-Savoy Hotel, Denver, Sept. 4-8. Dr. Walter J. Zeiter, 2020 E. 93d St., Cleveland 6, Executive Director.

American Hospital Association, St. Louis, Sept. 17-20. Mr. George Bugbee, 18 E. Division St., Chicago 10, Executive Director.

Colorado State Medical Society, Denver, Sept. 18-21. Mr. Harvey T. Sethman, 1612 Tremont Place, Denver 2, Executive Secretary.

Mississippi Valley Medical Society, Peoria, Ill., Sept. 19-21. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.

Montana Medical Association, Great Falls, Sept. 13-16. Mr. L. R. Hegland, 104 N. Broadway, Billings, Executive Secretary.

National Medical Association, Philadelphia, Aug. 20-24. Dr. John T. Givens, 1108 Church St., Norfolk 10, Va., General Secretary.

Neurosurgical Society of America, Sun Valley, Idaho, Sept. 12-14. Dr. C. D. Hawkes, 22 N. Manassas St., Memphis 5, Tenn., Secretary.

Nevada State Medical Association, Riverside Hotel, Reno, Sept. 13-15. Dr. Wesley W. Hall, 307 W. Sixth St., Reno, Secretary.

Northeastern Section, Southeastern Surgical Congress, Lord Baltimore Hotel, Baltimore, Sept. 13-15. Dr. W. Raymond McKenzie, Medical Arts Bldg., Baltimore 1, Secretary.

North Texas-Southern Oklahoma Fall Clinical Conference, Wichita Falls, Texas, Sept. 19. Dr. W. L. Powers, 517 Hamilton Bldg., Wichita Falls, Chairman.

Pennsylvania, Medical Society of the State of, Pittsburgh, Sept. 16-20. Dr. Walter F. Donaldson, 500 Penn Ave., Pittsburgh 22, Secretary.

Reno Surgical Society Conference, Riverside Hotel, Reno, Nev., Aug. 23-25. Dr. Olin C. Moulton, 130 N. Virginia St., Reno, Nev., Chairman.

Rocky Mountain Radiological Society, Denver, Aug. 9-11. Dr. Maurice D. Frazer, 1037 Stuart Building, Lincoln, Nebr., Secretary.

Texas Academy of General Practice, Shamrock Hotel, Houston, Texas, Sept. 10-11. Dr. B. H. Bayer, 104 E. 20th St., Houston 8, Secretary.

U. S. Chapter, International College of Surgeons, Palmer House, Chicago, Sept. 10-14. Dr. Arnold S. Jackson, 1516 Lake Shore Drive, Chicago, Executive Secretary.

Utah State Medical Association, Salt Lake City, Sept. 13-15. Dr. T. C. Weggeland, 42 S. Fifth East St., Salt Lake City, Secretary.

Washington State Medical Association, Olympic Hotel, Seattle, Sept. 9-12. Dr. James W. Haviland, 338 White-Henry-Stuart Bldg., Seattle, Secretary.

Western Society of Electro-Encephalography, Olympic Hotel, Seattle, Sept. 7-9. Dr. Nicholas A. Bercel, 450 N. Bedford Drive, Beverly Hills, Calif., Secretary.

INTERNATIONAL

European Congress on Rheumatism, Barcelona, Spain, Sept. 24-27. Dr. Gunnar Edström, Sweden, Secretary.

General Practitioners Study Club International, Rome, Italy, Sept. 12-15. Dr. John O'Connell, 10300 Lackland Road, St. Louis 14, Mo., U. S. A., President.

International Anesthesia Research Society, London, England, Sept. 3-7. Mr. R. W. Cope, University College Hospital, London W.C.1, England.

International Association of Allergists, Zurich, Switzerland, Sept. 23-29. Prof. A. S. Grumbach, Hygiene Institut der Universitaet Zurich, Gloriastr. 32, Zurich, Switzerland.

International Congress of Anesthesiology, Nursing School of the Salpiettre, 47 Boul de l'Hospital, Paris, France, Sept. 20-22. 12 rue de Seine, Paris 6ᵉ, France, Secretariat.

International Congress on Entomology, Amsterdam, Holland, Aug. 17-24. Dr. J. de Wilde, 136 Rapenburgerstraat, Amsterdam, Secretary.

International Congress on Industrial Medicine, Instituto Superior Técnico, Lisbon, Portugal, Sept. 9-15. Dr. Luis Guerreiro, Instituto Nacional do Trabalho e Previdência, Praça do Comercio, Lisbon, Secretary General.

International Congress on Mental Health, Mexico City, Mexico, Dec. 11-19. Mrs. Grace E. O'Neill, Division of World Affairs, National Association on Mental Health, 1790 Broadway, New York 19, N. Y.

International Congress of Physical Medicine, London, England, July 14-19. Dr. A. C. Boyle, 45, Lincoln's Inn Fields, London, W.C.2, England, Honorary Secretary.

International Gerontological Congress, Hotel Jefferson, St. Louis, Mo., U. S. A., Sept. 9-14. Dr. John E. Kirk, 5600 Arsenal Street, St. Louis 9, Mo., Chairman, Program Committee.

International Poliomyelitis Congress, Copenhagen, Denmark, Sept. 3-7. Prof. Dr. Niels Bohr, Statens Seruminstitut, 80 Amager Blvd., Copenhagen S., Denmark, President.

International Society of Surgery, Paris, France, Sept. 24-29. Dr. L. Dejardin, 141, rue Belliard, Brussels, Belgium, Secretary General.

International Society for the Welfare of Cripples, Fifth World Congress, Stockholm, Sweden, Sept. 9-14. Mr. Donald V. Wilson, 54 E. 64th St., New York 21, N. Y., U. S. A., Executive Director.

Pan Pacific Surgical Association Congress, Honolulu, Hawaii, Nov. 7-19. Dr. Forrest J. Pinkerton, Suite 7, Young Bldg., Honolulu, Hawaii, President.

World Confederation for Physical Therapy, Copenhagen, Denmark, Sept. 7-8.

World Medical Association, Stockholm, Sweden, Sept. 15-21. Dr. Louis H. Bauer, 2 E. 103d St., New York 29, N. Y., U. S. A., Secretary General.

EXAMINATIONS AND LICENSURE

BOARDS OF MEDICAL EXAMINERS

Alabama: *Examination.* Montgomery, June 24-26, 1952. Sec., Dr. D. G. Gill, 537 Dexter Ave., Montgomery 4.

Arkansas:* *Regular.* Little Rock, Nov. 8-9. Sec., Dr. Joe Verser, Harrisburg.

California: *Written.* San Francisco, Aug. 20-23. *Oral.* Los Angeles, August 18. *Oral and Clinical Examination for Foreign Medical School Graduates.* Los Angeles, August 19. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

Colorado:* *Reciprocity.* Denver, Oct. 9. Final date for filing application is Sept. 24. Ex. Sec., Mrs. Beulah H. Hudgens, 831 Republic Bldg., Denver 2.

Georgia: Atlanta, June. August, Oct. 9-11. Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta.

Guam: The Commission on Licensure will meet whenever a candidate appears or submits his credentials. Ex. Sec., Dr. John Y. Battenfield, Agana.

Illinois: Chicago, Oct. 9-11. Superintendent of Registration, Mr. Charles F. Kervin; Capitol Building, Springfield.

Indiana: Indianapolis, June 1952. Sec., Dr. Paul R. Tindall, 1138 K of P Bldg., Indianapolis 4.

Kansas: Topeka, Dec. 12-13. Sec., Dr. O. W. Davidson, 772 New Brotherhood Bldg., Kansas City.

Kentucky: *Examination.* Louisville, Dec. 11-13. Sec., Dr. Bruce Underwood, 620 S. 3rd St., Louisville.

Maryland: *Examination.* Baltimore, Dec. 11-14. Sec., Dr. Lewis P. Gundry, 1215 Cathedral St., Baltimore.

Michigan:* *Examination.* Lansing, Oct. 10-12. Sec., Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing.

Minnesota: * Minneapolis, Oct. 16-18. Sec., Dr. Julian F. DuBois, 230 Lowry Medical Arts Bldg., St. Paul 2.

Mississippi: *Reciprocity.* Jackson, December. Asst. Sec., Dr. R. N. Whitfield, Old Capitol Bldg., Jackson.

Nevada:* Carson City, August 6. Sec., Dr. G. H. Ross, 112 North Curry St., Carson City.

New Hampshire: Concord, Sept. 12-13. Sec., Dr. John Samuel Wheeler, Room 107 State House, Concord.

New Jersey: *Examination.* Trenton, Oct. 16-19. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

New Mexico:* Santa Fe, Oct. 8-9. Sec., Dr. Charles J. McGoey, Coronado Bldg., Santa Fe.

New York: *Examination.* Albany, Buffalo, New York and Syracuse, Oct. 31-Nov. 3. Sec., Dr. Jacob L. Lochner, Jr., 23 S. Pearl St., Albany.

Ohio: *Examination.* Columbus, December. *Reciprocity.* Columbus, Aug. 14 and Oct. 2. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus 15.

Puerto Rico: *Examination.* Santurce, Sept. 4. Sec., Mr. Luis Cueto Coll, Box 3717, Santurce.

South Carolina: *Reciprocity.* Columbia, Aug. 6, Sept. 10, Oct. 1. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

Texas: * *Reciprocity.* Marlin, Aug. 5. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Ft. Worth.

Virgin Islands: Charlotte Amlie, Nov. 7-8. Sec., Dr. Earle M. Rice, St. Thomas.

Wyoming: *Examination.* Cheyenne, Oct. 1. Sec., Dr. Franklin D. Yoder, State Capitol, Cheyenne.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Alaska: Juneau, August. Sec., Dr. C. Earl Albrecht, Box 1931, Juneau.

Arizona: *Examination.* Tucson, Sept. 18. Sec., Mr. Francis A. Roy, 423 Liberal Arts Bldg., University of Arizona, Tucson.

District of Columbia: *Examination.* Washington, Oct. 22-23. Sec., Dr. *Daniel L. Seckinger, 4130 E. Municipal Bldg., Washington.*

Michigan: Detroit and Ann Arbor, Oct. 12-13. *Examination.* Sec., Miss Eloise LeBeau, 501 W. Michigan Ave., Lansing 15.

Minnesota: *Examination.* Minneapolis, Oct. 2-3. Sec., Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis.

Nebraska: *Examination.* Omaha, Oct. 2-3. Director, Bureau of Examining Boards, Mr. Oscar F. Humble, Room 1009, State Capitol Bldg., Lincoln 9.

Nevada: *Examination.* Reno, July 3. Sec., Mr. Frank Richardson, University of Nevada, Reno.

Oklahoma: Oklahoma City, Sept. 14. Sec., Dr. Frank C. Gallaher, 813 Braniff Bldg., Oklahoma City 4.

Oregon: *Examination.* Portland, Sept. 8 and Dec. 1. Sec., Dr. Charles D. Byrne, State Board of Higher Education, University of Oregon, Eugene.

Rhode Island: *Examination.* Providence, August 8. Administrator of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

Texas: *Examination.* Austin, October. Chief Clerk, Mr. B. H. Kirk, 306 Nalle Bldg., Austin.

Wisconsin: *Examination.* Madison, Sept. 22. Sec., Mr. W. H. Barber, Ripon College, Ripon.

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* Basic Science Certificate required.

DEATHS

Dock, George ⊕ recipient of the Distinguished Service Medal and Award of the American Medical Association in 1944, died at his home in Altadena, Calif., May 30, at the age of 91, of pneumonia. Dr. Dock was born at Hopewell, Pa., April 1, 1860. He received the doctor of medicine degree of the University of Pennsylvania Department of Medicine, Philadelphia, in 1884. From 1887 to 1888 Dr. Dock was an assistant in clinical pathology at the University of Pennsylvania, becoming professor of pathology at the Texas Medical College and Hospital, Galveston, in 1888. He left Texas in 1891, to become professor of theory and practice of medicine and clinical medicine at the University of Michigan, Ann Arbor, where he remained until 1908. From 1908 until 1910 he held the title of professor of theory and practice of medicine at Tulane University of Louisiana School of Medicine in New Orleans. He was professor of medicine and dean at Washington University School of Medicine in St. Louis from 1910 to 1922. At the time of his death he was an honorary professor of medicine at the University of Southern California in Los Angeles. Dr. Dock was a member of numerous scientific societies, including the American Association for the Advancement of Science and the Association of American Physicians, of which he had been president in 1916-1917; a fellow of the American College of Physicians, and an honorary member of the Los Angeles County Medical Society. In 1897 and in 1913 he was vice president of the International Medical Congress, at Moscow and London, respectively. A member of the American Medical Association, Dr. Dock served in the House of Delegates in 1908-1909. Previous to 1934 he was for a number of years president of the Barlow Medical Library Association. Since 1934, when that library became the library of the Los Angeles County Medical Association, he had served on the library committee of this organization. During the celebration of Dr. Dock's 80th birthday by the Los Angeles County Medical Society in 1940, on which occasion the organization of the Walter Jarvis Barlow Society of the History of Medicine simultaneously held its first public meeting, Dr. Dock gave the first lecture of the George Dock Lectureship in the History of Medicine. He was a specialist certified by the American Board of Internal Medicine, a surgeon during the Spanish-American War and World War I, and the oldest member of the staff of Huntington Memorial Hospital. Dr. Dock was the co-author of a book on hookworm disease and of articles and chapters in many textbooks on medicine and served on the editorial board of *Archives of Internal Medicine*. He was awarded an honorary A.M. degree from Harvard in 1895, the Sc.D. degree from the University of Pennsylvania in 1904, and the LL.D. degree from the University of Southern California in Los Angeles in 1936.

Donohoe, Lucius Francis ⊕ Bayonne, N. J.; born Jan. 6, 1868; University of the City of New York Medical Department, New York, 1889; served as acting president of the Medical Society of New Jersey; past president of the Hudson County Medical Society; formerly mayor, city commissioner, county physician, and president of the board of education; served during World War I and was named a chevalier of the Legion of Honor by the French Republic in recognition of his services in France; fellow of the American College of Surgeons; member of the founders group of the American Board of Surgery; member of the House of Delegates of the American Medical Association from 1939 through 1945 and in 1947; affiliated with Bayonne Hospital since 1894, serving as president of the medical board of the hospital, medical director and vice president of the board of directors; served on the state board of visitors of the Agricultural College of Rutgers University, New Brunswick; died May 23, aged 83, of arteriosclerotic heart disease.

Dunning, William Meddaugh ⊕ New York; born in Branchville, N. J., Dec. 23, 1868; University of the City of New York Medical Department, 1892; an Associate Fellow of the American Medical Association; specialist certified by the American Board of Otolaryngology; past president of the Bronx County Medical Society; served as vice president of the Medical Society of the State of New York; formerly professor of otology at Fordham University School of Medicine and on the faculty of the New York Post-Graduate Medical School; for many years affiliated with the Bronx Eye and Ear Infirmary; for a time consulting surgeon at the Manhattan Eye and Ear Infirmary and consulting otologist at Fordham Hospital, the Ossining (N. Y.) Hospital, and the Alexander Linn Hospital in Sussex, N. J.; in 1912 exhibited prepared specimens of the temporal bone before the International Otological Society in Boston; author of "Submucous Resection of the Nasal Septum"; died May 11, aged 82, of coronary heart disease.

Marrs, Frederick Addison ⊕ Stevens Point, Wis.; Northwestern University Medical School, Chicago, 1912; also a graduate in pharmacy; member of the American Association of Industrial Physicians and Surgeons; past president of the Portage County Medical Society and the Ninth Councilor District Medical Society; formerly physician for the athletic department of Central State Teachers College; for many years city health officer; served as local physician for the Soo Line Railroad; one of the first members of the staff of St. Michael's Hospital; died March 22, aged 68.

Agan, John Newton, Los Angeles; Hospital College of Medicine, Louisville, 1891; died May 17, aged 87, of arteriosclerosis.

Anderson, Earvye Harry ⊕ Chicago; Loyola University School of Medicine, Chicago, 1918; served during World War I; died in Loretto Hospital May 20, aged 63, of acute myocardial infarction and coronary sclerosis.

Bakes, Edwin Clair, Phoenix, Ariz.; University of Louisville (Ky.) Medical Department, 1903; member of the American Medical Association; civilian examiner for the army induction station; affiliated with Good Samaritan Hospital, where he died May 31, aged 72.

Beaudoux, Henry Alexander, Saratoga, Calif.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1895; member of the American Medical Association; specialist certified by the American Board of Ophthalmology; served during World War I; affiliated with O'Conner Hospital in San Jose; died May 20, aged 79, of coronary occlusion.

Becker, Eli George ⊕ Convoy, Ohio; Eclectic Medical Hospital, Cincinnati, 1926; member of the Van Wert County Board of Health; on the staffs of Van Wert County Hospital in Van Wert, Ohio, and the Methodist Hospital in Fort Wayne, Ind., where he died May 19, aged 54, of carcinoma.

Black, Martin Luther, Knoxville, Tenn.; Lincoln Memorial University Medical Department, Knoxville, 1915; member of the American Medical Association; served during World War I; died in Knoxville General Hospital May 31, aged 62, of carcinoma of the lung.

Bossingham, Ottmer Nathaniel, Clarinda, Iowa; State University of Iowa College of Medicine, 1898; member of the American Medical Association; served on the staff of Clarinda Municipal Hospital; died May 28, aged 79, of coronary occlusion.

Brown, Stanley Robert, Elizabeth, N. J.; New York Homeopathic Medical College and Hospital, New York, 1895; died in Hawthorne, N. Y., May 25, aged 79, of coronary occlusion.

Butler, William Lucas ⊕ Stafford, Kan.; University of Tennessee College of Medicine, Memphis, 1912; member of the American Association of Railway Surgeons; for many years surgeon for the Santa Fe Railway; served during World War I; chief of staff, Stafford City Hospital; affiliated with Grace Hospital in Hutchinson; charter member and past president of the Rotary Club; died in St. Elizabeth Mercy Hospital, Hutchinson, May 25, aged 64, of carcinoma of the right lung.

⊕ Indicates Fellow of the American Medical Association.

Casey, Emmet Francis, Chicago; University of Illinois College of Medicine, Chicago, 1916; served during World War II; died in the Veterans Administration Hospital, Hines, May 19, aged 56, of pneumonia.

Chamness, Clyde James, Elkville, Ill.; Chicago College of Medicine and Surgery, 1910; served overseas during World War I; affiliated with Marshall Browning Hospital in DuQuoin; died in St. John's Hospital, St. Louis, May 13, aged 63, of hypertension and cerebral vascular accident.

Cliff, Harry Roberts, Portland, Ore.; Darlington Medical School, Sydney, Australia, 1880; member of the American Medical Association; at one time a medical officer in the Australian Navy; formerly practiced in St. Helens, where he had been mayor; for many years county health officer; from 1914 to 1943 director of Multnomah County Hospital, where he died May 23, aged 91, of cerebral hemorrhage.

Dalberg, Walter James, Elizabeth, N. J.; Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg, Baden, Germany, 1920; member of the American Medical Association; affiliated with St. Elizabeth Hospital in Elizabeth and St. Barnabas Hospital in Newark; died May 14, aged 58, of coronary thrombosis.

Darnell, William Turner, Middletown, Ohio; Jenner Medical College, Chicago, 1908; member of the American Medical Association; served during World War I; on the staff of the Middletown Hospital, where he died May 28, aged 68, of coronary thrombosis.

Demase, Joseph Charles, Pittsburgh; University of Pittsburgh School of Medicine, 1947; served during World War II; teaching fellow in obstetrics and gynecology at Elizabeth Steel Magee Hospital, where he died May 14, aged 27, of acute myocarditis.

Dunn, Oscar Orlando, Bradford, Ark.; University of Arkansas School of Medicine, Little Rock, 1911; died in Newport May 17, aged 66.

Easley, Henry Owen, Iron Gate, Va.; University of Virginia Department of Medicine, Charlottesville, 1904; member of the American Medical Association; served as president of the Alleghany-Bath Counties Medical Society; affiliated with Chesapeake and Ohio Hospital in Clifton Forge, where he died March 25, aged 71, of cerebral hemorrhage.

Eason, William Henry, Tupelo, Miss.; Memphis (Tenn.) Hospital Medical College, 1913; member of the American Medical Association; affiliated with North Mississippi Community Hospital; died May 11, aged 64, of congestive heart failure.

Eddington, Royal Lacey, Lacon, Ill.; Barnes Medical College, St. Louis, 1900; member of the American Medical Association; past president of the Woodford County Medical Society; served as mayor and county coroner; died in the John C. Proctor Hospital, Peoria, May 15, aged 72, of cerebral hemorrhage.

Ely, Nina Maynard, Los Angeles; Hering Medical College, Chicago, 1900; member of the American Medical Association and the Michigan State Medical Society; died May 23, aged 81.

Farber, William Daniel, Allentown, Pa.; Jefferson Medical College of Philadelphia, 1896; died in Allentown General Hospital May 16, aged 83, of arteriosclerotic heart disease.

Fenton, Alfred Archibald. ⊕ Norwood, Mass.; University of Vermont College of Medicine, Burlington, 1908; served during World War I; school physician; for many years member of the staff of Norwood Hospital; died May 5, aged 66.

Finbury, Charles Mysel, Haverhill, Mass.; Harvard Medical School, Boston, 1949; interned at Kings County Hospital; certified by the National Board of Medical Examiners; died in Massachusetts General Hospital, Boston, February 27, aged 27, of abdominal carcinoma.

Gattis, Emmett, Winchester, Tenn.; Chattanooga Medical College, 1901; died March 29, aged 76.

Gellert, Samuel Morse ⊕ Portland, Ore.; University of Oregon Medical School, Portland, 1907; died in St. Vincent's Hospital May 24, aged 67, of uremia.

Glass, Jesse Oscar, Cleveland; St. Louis College of Physicians and Surgeons, 1903; died May 25, aged 73.

Gordon, Homer James, Chicago; Chicago Medical School, 1921; member of the American Medical Association; field officer for the board of health; affiliated with Mount Sinai Hospital, where he died March 31, aged 53, of carcinoma.

Hamill, Claude Emmett ⊕ Parsons, Kan.; Northwestern University Medical School, Chicago, 1909; died April 6, aged 74, of carcinoma of the inguinal gland and nephritis.

Harris, Bryce Wilson ⊕ Memphis, Tenn.; University of Tennessee College of Medicine, Memphis, 1922; member of the Medical Association of Georgia; at one time served in the regular U. S. Navy; died April 12, aged 57, of coronary thrombosis.

Hayhurst, Leman Harrison, Greenwich, Ohio; University of Louisville (Ky.) Medical Department, 1910; served for several terms on the board of education and as president for one term; affiliated with Willard Municipal Hospital in Willard, where he died May 16, aged 75, of carcinoma of the pancreas.

Hill, William Isaac, Albemarle, N. C.; University of Maryland School of Medicine, Baltimore, 1897; member of the American Medical Association; county health officer; affiliated with Stanly County Hospital; died May 23, aged 81, of coronary occlusion.

Hutchinson, Joseph L. ⊕ Seattle; Milwaukee Medical College, 1905; an Associate Fellow of the American Medical Association; affiliated with Providence Hospital; died May 20, aged 78, of cerebral thrombosis.

Jones, William Monroe, Tulsa, Okla.; John A. Creighton Medical College, Omaha, 1905; member of the American Medical Association; died May 21, aged 76.

Kelley, Erwin E., Herkimer, N. Y.; the Hahnemann Medical College and Hospital, Chicago, 1886; formerly assemblyman for New York State; died May 27, aged 88, of cerebral embolism and terminal pneumonia.

Kerr, Frederick William Jr., Staten Island, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1926; member of the American Medical Association; affiliated with St. Vincent's, Staten Island, Sea View, and Richmond Memorial hospitals; died May 22, aged 50, of heart disease.

Kolipinski, Louis Xavier ⊕ Richmond, Va.; Medical College of Virginia, Richmond, 1936; member of the American Psychiatric Association; served during World War II; died March 31, aged 44, of heart disease.

Krohn, Irwin Kjelland ⊕ Black River Falls, Wis.; Rush Medical College, Chicago, 1924; physician in charge of the Krohn Hospital and Clinic, of which he was a founder; died May 12, aged 51, of coronary occlusion.

Lindquist, Nils S., South Bend, Ind.; the Hahnemann Medical College and Hospital, Chicago, 1899; died in St. Joseph's Hospital April 29, aged 75, of coronary thrombosis.

Loughlin, John Joseph, New York; Fordham University School of Medicine, New York, 1915; member of the American Medical Association; for many years with the police department, serving as its chief surgeon; died May 26, aged 62.

Lyon, Herbert Millard ⊕ Buffalo; University of Buffalo School of Medicine, 1929; president of the board of trustees of Taylor University, Upland, Ind.; affiliated with Deaconess Hospital; died in Sisters of Charity Hospital May 24, aged 48.

McGuire, Evaline Merriam, Humeston, Iowa; Woman's Medical College, Chicago, 1891; died in Garden Grove, April 28, aged 85, of myocardial failure and cardiovascular renal disease.

Martin, Leon Herbert, Okeechobee, Fla.; Barnes Medical College, St. Louis, 1910; member of the American Medical Association; served overseas during World War I and was awarded the Silver Star; served during World War II; died in the U. S. Air Force Hospital, Tampa, Fla., May 17, aged 61, of arteriosclerosis and cerebral hemorrhage.

Mitchell, James M., Oblong, Ill.; Hospital College of Medicine, Louisville, 1901; member of the American Medical Association; died March 28, aged 96, of chronic endocarditis.

Smith, Thomas D., Kingsburg, Calif.; Eclectic Medical Institute, Cincinnati, 1892; affiliated with Selma Sanitarium in Selma, where he died May 15, aged 86, of chronic myocarditis.

GOVERNMENT SERVICES

ARMY

Army Needs Women Medical Specialists.—The Army has renewed its call for more women medical specialists, and has reduced the minimum tour of active duty from the 21 months to 12 months, with opportunities for appointment in the Regular Army.

Last January the Army indicated a need for 247 dieticians, 179 physical therapists, and 146 occupational therapists, but only 22 dieticians, six physical therapists, and 19 occupational therapists were obtained and ordered to active military service by May of this year.

To simplify the procurement of these specialists, procurement officers have been made available in Army Area Headquarters to conduct personal interviews and acquaint qualified women specialists with opportunities available to them in the Army.

Additional information may be obtained from any Army Area Headquarters, or by writing to the Surgeon General, Department of the Army, Washington 25, D. C., attention: Chief, Women's Medical Specialist Corps.

Conference of Professors of Military Medicine.—The sixth annual Army-Air Force Medical Service Conference of professors of military science and tactics will be held August 6-9 at the Medical Field Service School, Ft. Sam Houston, Texas. This conference is held yearly for the 76 Army and Air Force officers assigned as professors of military science and tactics in 48 medical, 18 dental, six veterinary and four pharmacy schools throughout the country. The majority of the 30 newly assigned officers are recently rotated veterans of the Korean campaign.

Among the participants will be representatives of the Adjutant General's Office; the Armed Forces Medical Policy Council; Office of the Chief, Army Field Forces, and the Surgeons General's offices of the Army and Air Force, and liaison officers of the Royal Army Medical Corps and the Royal Canadian Army Medical Corps.

Personal.—Col. Tom F. Whayne (MC) has assumed the duties of chief, preventive medicine division, Office of the Surgeon General, replacing Col. Don Longfellow who has been named a special assistant to the Surgeon General and detailed to the Army Logistical Support Panel at Ft. Monroe, Va.

AIR FORCE

Aerial Hospital Units.—During a two-day conference at the School of Aviation Medicine, Randolph Field, Texas, in July, Brig. Gen. Otis O. Benson Jr., commandant of the school, said that operations in Korea over the past year have shown that it is entirely practical to remove Armed Forces casualties from the fighting fronts by plane. But a continuous research program is necessary to insure the utmost comfort and safety for litter-borne passengers. The Air Force has been given responsibility for evacuating front-line patients for all branches of the Armed Forces, returning them to hospitals in the rear. Materiel needed to carry out this mission includes light planes and helicopters to assemble the wounded in forward areas, airborne medical units, and trained personnel, in addition to the long-range aircraft that fly the casualties home from a war theater.

Maj. Charles A. Cubbler, from the Surgeon General's office, reported that Air Force helicopter squadrons are being organized with all possible speed to take over the work of the miscellaneous airlift facilities improvised by the various arms of the Services as the Korean War expanded. Aerial hospital units have been designed that can be set up anywhere in a combat zone, providing emergency medical treatment at the airhead. The School of Aviation Medicine, in cooperation with the Military Air Transport Service, has worked out standard procedures for handling patients both in flight and on the ground.

Underground Hospital.—On Johnston Island, a unit of barren coral rock that is a strategic base for the Pacific Division of the Military Air Transport Service, there is a modern dispensary-hospital located eight feet under the sandy surface. It is entered through a concrete ramp that turns to baffle the force of possible bomb bursts. An independent auxiliary power plant provides light and electricity for sterilizers and other equipment, and for the blower system. Fourteen patients can normally be taken care of in the ward, but this number can be increased in case of emergency. At present only minor cases are treated at Johnston. Severe cases are flown to Hickam Air Force Base, near Honolulu, 819 miles away. The hospital includes the ward, office, administration section, recreation room, surgery, pharmacy and laboratory, and x-ray room. It is staffed by 14 medical technicians, and is headed by Dr. (Capt.) John T. Martin.

MISCELLANEOUS

Enlarge Radioisotope Export Program.—The U. S. Atomic Energy Commission on July 15 enlarged its radioisotope export program to include all radioactive materials now sold in this country on an unrestricted basis. This action increased the number of United States-produced isotopes available to buyers in foreign countries from 26 to 99.

The U. S. radioisotope export program has been in effect since Sept. 3, 1947, since which time 34 countries have completed arrangements to receive these radioactive substances. The isotopes most in demand in foreign countries have been P^{32}, I^{131}, and C^{14}. P^{32} is useful in agriculture and medicine, notably to determine the most efficient ways of using fertilizer, to locate brain tumors, and as a palliative treatment for certain types of leukemia. I^{131} is useful in medicine, notably in the diagnosis and treatment of thyroid disorders and the treatment of thyroid cancer. C^{14} is useful in a number of different fields, including particularly the study of plant and animal physiology.

The Commission said, in part:

> There is nothing secret or evil about radioisotopes in the forms in which they are sold in this country and abroad. While their utilization cannot significantly advance the atomic energy programs of nations, they can contribute, and are contributing, significantly to advancements in basic science, medicine, agriculture and industry. As of today, isotopes constitute the single most important contribution of atomic energy to peacetime welfare.

The new isotope program also permits the Oak Ridge National Laboratory, which produces most United States radioisotopes, to provide special irradiation services to scientists of other nations. Under this program, foreign scientists may send special materials to Oak Ridge to be made radioactive by exposure to the intense neutron radiation in the nuclear reactor there.

To buy United States-produced isotopes, foreign users must agree (1) to furnish the U. S. Atomic Energy Commission, on request, or at intervals of not more than one year, results of progress obtained with the use of radioisotopes procured from its facilities; and (2) to facilitate exchange of information and visits, relative to work with radioisotopes, between qualified scientists, without regard to nationality, in accordance with normal scientific practice. The procedures which foreign buyers must use in ordering isotopes from the United States, as well as information on the procedures United States buyers must use in ordering isotopes from Canada and the United Kingdom, are described in the 1951 Isotopes Catalog, available from the AEC Isotopes Division, Export-Import Branch, Oak Ridge, Tenn.

Personal.—After 39 years in Federal Food and Drug Law enforcement, Dr. Louis D. Elliott, associate commissioner of food and drugs, retired on June 30, and will be succeeded by Malcolm R. Stephens, now chief of the Chicago District.

FOREIGN LETTERS

PARIS

Diphtheria and Antidiphtheria Vaccination in Paris.—This subject was discussed at a recent meeting of the National Academy of Medicine. In 1925, before widespread vaccination, 2,836 cases of diphtheria, 188 of which were fatal, were recorded. In 1950, when 92% of the school children were vaccinated, 164 cases of diphtheria, of which five were fatal, were recorded in Paris. Four of these deaths occurred in nonvaccinated children. The report stresses that, among the 3,231,578 vaccinations, no serious incident was noted.

Production of Antibiotics in France.—France has begun to export, instead of import, antibiotics. In 1946, the amount of penicillin was 476 billion units; in 1947, imports fell to 251 billion units. Since 1948 there has been no importation, and since March, 1950, the production of penicillin has allowed export of 100 to 500 kg. per month. In 1946, 51 kg. of streptomycin was imported; and in 1949, 12,286 kg.; in 1950, the production of 1,200 to 1,300 kg. per month allowed monthly export of 200 to 300 kg. The same progress has been made with respect to tyrothricin. The national production of aureomycin, however, is in its early stages.

Meeting of the Council of the International Youth Center.—The fifth meeting of the International Youth Center, created in 1949, was held on May 21 and 22 at Longchamp Castle, Paris, under the presidency of Prof. Debré. Those present included Dr. Rajchman, vice president, Professors Aujaleu (Paris), Fanconi (Zurich), Carnero (UNESCO, Brazilian delegate), Guest (Cincinnati), and Wallgreen (Stockholm), and Drs. A. Wauters, past general director of the International Youth Center, and Gaud, general secretary.

The Center contains, in addition to lecture and meeting rooms, a library and reading room, and a BCG pilot station. The construction and arrangement, in the castle park, of a technical center (chemistry, biology, and seroimmunology laboratories) will be completed within a few months. The teaching program for 1951 is varied. It includes a course of social pediatrics from March 5 to June 30, which will be attended by 50 pediatricians, health officers, and social workers of 34 nations (47 have a scholarship from the Center and three from the World Health Organization). In addition to lectures and instruction, trips to Lille, Nancy, Strasbourg, Lyons, Mégève, and Rome will be arranged. There will also be a course on the rehabilitation of children with motor disability, attended by 30 pupils from 18 nations with Center scholarships. From Oct. 15 to Dec. 15, 1951, various methods of immunization and modern techniques of preparation of vaccines against the common contagious diseases of children will be presented to 30 epidemiologists from some 26 nations, 24 with Center scholarships and six with WHO scholarships.

Scientific studies include consideration of an immunological explanation for congenital defects associated with maternal virus disease, such as rubella, and research on antipertussis vaccination. The Center is subsidizing research, undertaken jointly in Paris and London, concerning the effect on the young child of lack of maternal care.

The activities for 1952 were scheduled. In addition to the courses given in 1951, there will be a colloquium on the problems of child welfare in tropical countries held in one of these countries and a seminar on the use of antibiotics in children's diseases. The study on pertussis will be extended to the use of liquid culture mediums for obtaining the vaccine and its intradermal administration. The president transmitted the request of certain countries of Africa and Near East for the Center's help in drives against trachoma and seasonal conjunctivitis and flies, which are the main vectors of these diseases.

Vitamin B_{12} in Herpes Zoster.—In *Le Médecin français* of May, 1951, R. Heyblon published the results of treatment with vitamin B_{12} in 11 cases of herpes zoster. In eight cases, recovery without sequelae was obtained in two to six days. The violent pains were suppressed with an average dose of 20 to 60 micrograms. He proposes the daily administration of 30 micrograms during eight days.

Death of Prof. Leroux.—Prof. Leroux, a member of the National Academy of Medicine, was a prominent anatomopathologist. He was an associate director of the cancer institute for several years. His numerous works were especially concerned with the experimental reproduction of tumors and their curability by physical means. Prof. Leroux was a great master of medical teaching.

SWEDEN

Medical Preparations for War.—In the fall of 1950, representatives of the leading medical societies in Sweden agreed to hold a joint meeting at which the medical profession would be informed of plans for various problems in the event of World War III. This meeting materialized on April 13-14, 1951, and was attended by some 500 doctors and many laymen with important duties arising from totalitarian warfare. At this meeting, lectures were given by experts on one or other of the 12 following items: treatment of shock and burns, blood transfusion, radiological lesions caused by atomic bombs and radioactive weapons, chemical and bacteriological warfare, principles governing surgical treatment, detonation lesions, inanition due to war injuries, infectious diseases under war conditions and mass migration, psychological defense measures and control of panic, and organization of warfare psychiatry.

The organ of the Swedish Medical Association, *Svenska Läkartidningen*, has undertaken to publish these lectures in fortnightly installments. It was stated frankly at this meeting that one of the greatest problems to be tackled concerns the already existing as well as the anticipated shortage of both doctors and nurses. Even the 241 doctors over age 70 will have special duties assigned them. As for the 4,547 doctors under this age, as many as 1,936 will be called on for military service and the remainder for various other services. To economize in doctors, most of them will be attached to hospitals for inpatient and outpatient services. Central hospitals will retain only about 10% of their original patients, two-thirds of whom will be sent home and a quarter transferred to smaller and less exposed hospitals.

There are some 19,000 women who have been trained as nurses, but some 1,500 of them have been pensioned off and some 3,600 have married and have children under the age of 15. These married nurses will, however, be called up, and special arrangements will be made for the care of their children. Some 2,000 midwives will also have to play their part, and many of them will be diverted from their present duties. Preparations for biological warfare require an organization for the rapid limitation of epidemic diseases by isolation, vaccination, and other measures which may be linked up with regional laboratories still in their infancy. Provision is also being made for vaccination on a large scale against tetanus in the fighting forces. The wholesale adaptation of motor buses to the transport of the sick is also being organized.

The Bright Side of Hospital Administration Today.—A recent study of conditions in the central hospital of the County of Stockholm has encouraged Dr. Bertil Bager of Stocksund to challenge the present tendency to bemoan the difficulties due to the shortage of hospital workers, the high cost of living, overcrowding, and obstacles in the way of modernizing old and building new hospitals. He suggests looking on the bright side to see

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The items in these letters are contributed by regular correspondents in the various foreign countries what a marvelous revolution has occurred during the last decade, owing to the efficacy of new drugs, early ambulation after operation, new methods of operation, better anesthesia, more reliable radiological diagnosis, improved laboratory tests, more effective preparation of patients for operations, and better after-care. All these advances in medicine have hastened the turnover of hospital cases with dramatic effect. In the hospital in question, 2,357 patients were admitted in 1940, whereas in 1950 this figure was raised to 4,077 despite the reduction in the number of available beds. During the 11-year period 1940-1950, the length of stay in hospital was reduced from 20.5 to 9.8 days per patient. During the same period the number of operations performed rose from 1,660 in 1940 to 2,754 in 1950.

Another economy in the administration of hospital beds is the evolution of the polyclinic, or outpatient, treatment of some elements of the community who either need not embarrass hospital beds at all or who receive treatment outside hospital in preparation for an operation within its walls. Dr. Bager points out that the average duration of treatment in hospital per head for all the hospitals in Sweden has fallen between 1940 and 1948 from 19 to 15.2 days. Evidently this fall cannot be as great in medical as in surgical hospitals. In a country with an area as large as that of Sweden, conditions with regard to hospital accommodation show great local variation, and the hospital that serves a very wide area with defective means of transportation is bound to keep some patients for a longer time than the hospital not thus handicapped. There is one great drawback to the increased turnover of patients in hospital, particularly a surgical hospital: Much extra nursing care is needed during the first few days after an operation, and, when the operation rate is doubled, the calls made on the nursing staff are also greater.

Congenital Malformation from Rubeola in the Mother.—The widespread epidemics of rubeola throughout Sweden in recent times have drawn attention to the risks of congenital malformation in the offspring of mothers contracting it in the first two or three months of pregnancy. Dr. Rolf Lundström of the State Bacteriological Laboratory in Stockholm has lately pointed out that the laboratory is cooperating with the Swedish Ministry of Health with a view to studying the incidence of such malformations as a sequel to rubeola in early pregnancy. The necessary data are being collected in the maternity centers in the country, and preparations are being made for the histological examination of material obtained in cases of spontaneous abortion presumably due to rubeola. The State Bacteriological Laboratory has prepared a serum from convalescents from rubeola for the treatment of expectant mothers exposed to infection with rubeola during the first four months of pregnancy.

Dr. Lundström deals in the same connection with a wider issue—that of the provision of every member of the community with a health card on which medical data are entered. It would, for example, be an advantage for both doctor and expectant mother to know for certain from such a record whether she had had rubeola. Were this disease to be included among the notifiable diseases, it would be easier to take suitable action when the existence of a previous attack of rubeola is questioned. Soon after the observation by Gregg of Australia in 1941 of the high rate of congenital malformations in children borne to mothers who had suffered from rubeola early in pregnancy, it was feared that the risk of congenital cataract, deaf-mutism, heart disease, microcephaly, mental backwardness and the like might be close to 100% if the infection occurred in the first two months of pregnancy. Dr. Lundström considers this risk much exaggerated, and it may well prove to be under 50%. Yet it is so serious that young girls should be encouraged to contract rubeola and pregnant women should be kept out of contact with it as much as possible. Though rubeola early in pregnancy may sometimes be an indication for interruption of pregnancy, Dr. Lundström urges great caution in taking such action.

Penicillin Prophylaxis for Endemic Scarlatina.—The Slagsta seminary is an institution for the care of mentally defective children and the training of their teachers. It houses, altogether, some 300 persons who during 1948-1950 were the victims of endemic scarlatina and acute infections of the upper respiratory tract. The housing conditions were such that the effective isolation of cases was difficult. In these circumstances various alternatives for combating recurrent outbreaks of scarlatina were discussed, and inoculation with large doses of Dick toxin and prophylactic treatment with sulfonamides were set aside in favor of penicillin. With the cooperation of the State Bacteriological Laboratory and the Stockholm Fever Hospital, Dr. Per Hedlund of Stocksund gave tentative and small doses of penicillin by injection in March, 1949, and by mouth in tablet form in March, 1950. On both occasions a systematic search was made for hemolytic streptococci in the throats and noses of all concerned. In 1949, penicillin was given only to those persons in whom hemolytic streptococci were found. It was given by intramuscular injection (50,000 units dissolved in 1 ml. of isotonic sodium chloride solution) morning and evening for four days. Children under 5 were given half this dose. In 1950, everyone in the seminary was given 50,000 units by mouth morning and evening on an empty stomach for six days.

During this investigation, which lasted about two and a half years, Dr. Hedlund came to the conclusion that with a prophylactic penicillin dosage considerably smaller than the therapeutic dosage, it is possible to combat endemic scarlatina in schools and other institutions with considerable effect. Both in 1949 and in 1950, this treatment effected a considerable reduction in the number of carriers. At the same time new cases of scarlatina did not occur during or directly after this treatment, although a few persons continued to be bacteriologically positive. The nasal mucosa was more effectively rid of hemolytic streptococci than was the throat. Two relatively penicillin-resistant strains of hemolytic streptococci have been isolated at the Stockholm Fever Hospital, but it is most unlikely that they can be responsible for epidemics of scarlatina.

ARGENTINA

First Pan-American Congress of Sports Medicine.—The South American Union of Sports Physicians participated in the organization of the South American congresses in Lima (1939), Buenos Aires (1941), Montevideo (1943), Río de Janeiro (1947), La Paz (1948), and again in Lima (1949). This year, late in February, the First Pan-American Congress of Sports Medicine was held in Buenos Aires at the time of the Pan-American Olympic Games.

The Congress advised the establishment of university chairs of sports medicine for physicians, with a diploma given at the end of the course; also advised were medical examinations before sports activities and organization of research laboratories. It was suggested, too, that women refrain from playing football and from boxing or catching, but basket-ball is acceptable under special rules. The Pan-American Union of Sports was established with Dr. José Pedro Reggi in Buenos Aires as secretary.

Politics in Universities and Hospitals.—The deans of the faculties of all the universities of Argentina "invite" all professors to sign a note asking for the reelection of the Argentine President General Juan Perón, although university law does not allow professors to take part in political activities. Physicians working in hospitals and public administration offices were asked to sign a similar note, in addition to which they must specify the political party to which they belong. Article 4 of the university law reads: "Professors and students should not take part directly or indirectly in politics as members of the university corporation, nor formulate conjoint declarations involving political militancy or intervention in questions alien to their specific function. Those who transgress these dispositions will be subject to suspension or dismissal."

Visitors.—Prof. Charles H. Best visited the scientific centers of Lima (Peru), Santiago (Chile), Córdoba, Rosario, and Buenos Aires (Argentina), Montevideo (Uruguay), and São Paulo and Río de Janeiro (Brazil). He stayed for 29 days in Argentina and delivered 11 interesting lectures. Prof. Best visited laboratories, exchanged ideas, and discussed scientific subjects with Latin American scientists.

Dr. Knoppers, professor of pharmacology in Amsterdam, visited laboratories in Argentina and delivered some lectures.

CORRESPONDENCE

POSTGRADUATE MEDICAL EDUCATION IN MEXICO

To the Editor:—It has been my privilege recently to visit several of the leading medical institutions in Mexico City. The outstanding educational opportunities that are now available in some of these Mexican hospitals should be better known by American physicians.

Among the institutions that are doing excellent research and clinical practice are the Hospital Infantil, the Hospital Nacional de Cardiologia, and the Hospital de Enfermadades de la Nutricion. All of them are affiliated with the national university (Universidad Nacional de Mexico) and offer postgraduate courses of lectures and conferences as well as internships and residencies. Their staffs are distinguished and their directors—Dr. Federico Gomez, Dr. Ignacio Chavez, and Dr. Salvador Zubiran—are internationally known.

In addition to the investigative work conducted at these hospitals, a wide variety of diseases are cared for and all these institutions provide certain clinical advantages. For example, at the Hospital de Enfermadades de la Nutricion there is a great deal of liver and amebic disease of various types; at the Hospital de Cardiologia there is an enormous amount of rheumatic disease much of which is different in character from that seen in the United States; and at the Hospital Infantil one can see patients with typhoid, advanced malnutrition and other disorders which are rarely seen at home. Also, as in Vienna, the autopsy rate is exceedingly high, making it possible to follow through almost all interesting problems.

Besides the institutions mentioned, unusual opportunities exist for work in tuberculosis and in tropical diseases and parasitology. Mexico City itself, as well as the surrounding country, is fascinating and a storehouse of history. In the city proper lies the oldest hospital on the continent still in existence—the Hospital de Jesus, founded and endowed by Cortes. In fact, the list of interesting places and institutions is practically unending.

An English-speaking physician desiring to study in Mexico should have at least a slight knowledge of Spanish beforehand and should plan to concentrate on it further for a while after arrival. This is certainly no more than is done by the many Mexican and other foreign-speaking physicians who study in the United States, and a knowledge of the language, incidentally, carries its own rewards. In some cases North American physicians might be able to obtain junior residencies from the institutions named; the foundations in the United States interested in medical education and the award of fellowships might also look with favor on applications of this kind, since they have always encouraged suitable graduate study abroad.

The possibility of taking some advanced medical training in Mexico is particularly attractive, it seems to me, for physicians planning to enter academic branches of medicine. However, the specialty boards and the Council on Medical Education and Hospitals would doubtless approve appropriately selected study abroad for properly qualified physicians entering the clinical specialties. Those who may be seriously interested in the opportunities that may be available for graduate study of this kind in Mexico can obtain detailed information from the directors of the institutions mentioned.

Edwin P. Jordan, M.D.,
Charlottesville, Va.

Dr. Jordan's letter was referred to the office of the Council on Medical Education and Hospitals, whose comment follows.—Ed.

While Dr. Jordan's comments are of considerable interest, it should be noted that the Council on Medical Education and Hospitals limits its approval for intern and residency training to programs sponsored by hospitals in the United States and its possessions. It is unlikely that the Council's facilities and resources will be expanded sufficiently to enable it to extend its inspection and approval program to other countries. Some examining boards, however, give credit for residency work taken in foreign countries. Physicians interested in training opportunities outside the United States should confirm the acceptance of such training with the secretary of the examining board concerned.

It is possible to utilize the advantages offered in these institutions through the development of affiliating programs by hosptials in this country that have been officially recognized. Residents, under such an arrangement, might rotate for varying periods to the institutions in Mexico, without the latter being independently approved. Credit for training of this nature is granted on the basis of the approval extended to the parent hospital sponsoring the program.

CORTISONE AND ERYTHROCYTE SEDIMENTATION

To the Editor:—The editorial of May 12, 1951, on the effect of cortisone and ACTH on the erythrocyte sedimentation rate placed undue emphasis on but one of the suggested causes for the depression of fibrinogen and gamma globulin during hormonal therapy. Depression of these proteins is not necessarily a primary effect of the hormones, but may be principally a reflection of the effect of the hormones on the inflammatory disease process present in the patients studied.

The stimulus for producing excessive amounts of these proteins, particularly fibrinogen, and thereby effecting an elevation of the sedimentation rate, is usually an inflammatory reaction. This reaction is itself suppressed to a great degree during the period of hormone administration. Several studies, including our own, are summarized in the "Proceedings of the Second Clinical ACTH Conference" and have shown that many of the secondary results of various types of inflammatory reaction, such as fever and antibody production, may be inhibited to some degree by ACTH or cortisone but that this inhibition cannot be divorced from the effects of suppression of the inflammatory reaction itself.

It appears well established by recent careful studies of several investigators that cortisone inhibits the synthesis of certain proteins. This may well be the principal biochemical mechanism by which the hormone inhibits inflammatory responses and experimental wound healing. Although a similar mechanism may operate with respect to the serum proteins mentioned, the preponderant effect in disease states would appear to be inhibition of the inflammatory reaction irrespective of cause.

Edward E. Fischel, M.D.,
Columbia University College of Physicians
and Surgeons, New York.

SURGICAL TRAINING

To the Editor:—In regard to the excellent letter of E. P. Lehman in The Journal, May 19, 1951 (page 279), would it not be relevant to express this one truth, that men performing surgical operations should be able to do so safely and well? There is more than one path to any truth. Some men learn best through a residency type of training, others through assistantships. Some men who complete residencies still cannot perform good surgical work. Some residencies give insufficient experience and responsibility, so that such training does not automatically imply excellence.

In the hospital where I work, there are two men carrying on a heavy surgical schedule, one in general surgery, the other in gynecologic surgery, with a very minimal mortality rate. Other general practitioner surgeons with whom I am acquainted perform three and four hundred consecutive major operations without a death.

It is not where a man has been, but what he can do, that counts.

R. L. Gorrell, M.D.,
227 First Ave., N. E., Clarion, Iowa.

BUREAU OF LEGAL MEDICINE AND LEGISLATION

MEDICOLEGAL ABSTRACTS

Malpractice: Gauze Dressings in Patient's Throat Following Tonsillectomy.—*The plaintiff sued for damages resulting from the alleged negligence of the defendant in permitting gauze dressing to be left in the tonsil cavity following a tonsillectomy performed on the plaintiff. From a judgment in favor of the plaintiff, the defendant appealed to the Supreme Court of Utah.*

Before discussing the evidence, the Supreme Court pointed out that the better-reasoned cases announce a rule of law to the effect that in those cases which depend upon knowledge of the scientific effect of medicine, the results of surgery, or whether the attending physician exercised the ordinary care, skill and knowledge required of doctors in the community which he serves, must ordinarily be established by the testimony of physicians and surgeons. There is, however, another well-recognized rule holding that when facts may be ascertained by the ordinary use of the senses of lay witnesses, it is not necessary that expert testimony be produced and relied upon. Included within the latter rule, the Supreme Court continued, are those cases which are similar to the present one, namely, those actions involving negligence in leaving instruments, needles, sponges, bandages, gauze or foreign particles in incisions, wounds, or open cavities. So far as establishing negligence on the part of the doctor in this type of case is concerned, it would appear to be a matter of common knowledge that due care is lacking if surgical instruments, sponges, or medical supplies are not removed before an incision is closed or the wound healed; and lack of direct evidence of failure to remove is not fatal to the plaintiff's case when there is evidence from which an inference to that effect may legitimately be drawn.

In July, 1945, the plaintiff engaged the defendant physician to remove her tonsils, which was done under a local anesthetic. The operation consumed about an hour's time and it was necessary for the doctor to use gauze sponges. Immediately following the operation, and for almost three years, the plaintiff had a great deal of difficulty with her throat and she returned many times to the defendant as well as to some twelve other doctors and dentists for treatment during the three-year period. In the latter part of June, 1948, some pieces of cotton thread and gauze were removed from the sores and ulcers in the back of the plaintiff's mouth and from that time on her condition steadily improved.

On the basis of all the evidence, the Supreme Court held that the jury could reasonably find that thread, gauze and possibly catgut had in fact been left in the plaintiff's throat at sometime in the past and was removed therefrom in June, 1948. The question then was as to how the foreign material got into the plaintiff's throat. Three possibilities were suggested: First, that it was left there some twenty-five years before when a number of plaintiff's molars were extracted; second, that it was left there in June, 1946, when eighteen of the plaintiff's front teeth were extracted; third, it was left there by the defendant when he performed the tonsillectomy. The Supreme Court concluded that the jury could reasonably eliminate the first two possibilities. On the basis of the following facts and circumstances, however, the Supreme Court felt that the jury could reasonably find that the materials were left in the plaintiff's throat by the defendant.

Prior to the tonsillectomy plaintiff had not encountered any difficulty with her throat and mouth; the defendant performed the operation after examining her throat and finding only a diseased tonsil. In the course of removing the tonsils, he used gauze sponges to mop the fossa and used catgut to tie the bleeding vessels. He did not see the plaintiff for thirty days and prior to this time scar tissue would have formed and might have covered up any materials left in the tonsil fossa. The depth of the fossa could have been as much as three-quarters of an inch and there must have been considerable bleeding as the large type sponge was used and there was some tieing of blood vessels. Immediately after the operation, plaintiff commenced having difficulty with her throat and continuously for a year and a half thereafter at intervals of from three to four weeks she was returning to defendant's office and complaining about a sore throat and explaining to the defendant or his nurse that it felt like a lump was in her throat. Over a period of three years following the operation, plaintiff consulted with and received advice from twelve doctors or dentists in an attempt to get relief. She requested her remaining teeth to be pulled to remove any possible cause from that source. During that period and prior to the tonsillectomy, no gauze or sponge was inserted in her throat. Members of the medical profession observed the ulcers and concluded plaintiff was suffering from some physical disorder of the throat and mouth and some were of the opinion that cancer might be the cause. Plaintiff consulted experts on that disease and she was referred to Dr. Dolowitz to determine its presence. She submitted to two biopsies for that determination. No one had ever used any sponges, gauze or surgical materials in her mouth besides the defendant and the material exuded from the ulcers came from a sponge similar in type to the one used by the defendant. The defendant used catgut to tie some of the vessels and what appeared to be that type of tieing material was found in the discharge. Four lay witnesses and one medical expert testified to gauze or thread being imbedded in the plaintiff's throat in, around, and about the fossa. The materials exuded or extracted from the ulcerated areas were subjected to scientific analysis and proven to be parts of gauze or sponges. Over the period involved, plaintiff's acts and conduct were entirely consistent with her claim that immediately following the operation a lump developed in her throat, it became sore and continued that way until the foreign materials were removed.

Without question, said the Supreme Court, the evidence supported the verdict in favor of the plaintiff unless the jury was compelled to find that parts of gauze were not left on the fossa but on the ulcers and that the gauze could not have migrated from the fossa to the ulcers. Most of the medical experts testified that the materials could not migrate from the fossa to the area of the ulcers. Dr. Dolowitz, however, said that strange things happen and that it was possible that lateral migration might conceivably take place. Therefore, the jury was not bound to find that such a migration was impossible. This made a question of fact for the jury from which the inference could legitimately be drawn that bits of gauze and thread found in the ulcer were occasioned by leaving a part of a surgical sponge in the tonsil fossa.

The next question, said the Supreme Court, was whether or not the evidence precluded a finding that the gauze or threads could have remained in the tonsil cavity. Unquestionably strings and gauze were embedded in the ulcers and they had to get in the throat in some manner. The jury could, from the evidence, exclude every possibility except that the defendant placed them there. He used gauze material and catgut and it may have been in the use of the latter that the former was held in place. He admitted making an incision and the cut may have been deeper than necessary in a usual operation. In almost every malpractice case of this type there is medical evidence which casts doubt on the cause of the injury, yet the other facts and circumstances may point rather clearly to the cause. This merely results in a conflict in the evidence, to be reconciled by the jury.

In this case the conflict was reconciled by the jury in favor of the plaintiff, and the Supreme Court concluded that the finding of the jury was reasonably supported by the evidence adduced.

Accordingly the judgment in favor of the plaintiff and against the defendant physician was affirmed.—Fredrickson v. Maw, 227 P. (2d) 772 (Utah, 1951).

MEDICAL LITERATURE ABSTRACTS

AMERICAN

A.M.A. Am. Journal Diseases Child., Chicago

81:617-752 (May) 1951

- *Retrolental Fibroplasia: Role of Hemorrhage in Its Pathogenesis. W. E. Laupus and F. P. Bousquet Jr.—p. 617.
- Psychoeducational Study of Children Born Deaf Following Maternal Rubella in Pregnancy. E. S. Levine.—p. 627.
- *Treatment of Typhoid in Children with Chloramphenicol (Chloromycetin®): Report of Seven Cases. J. Greengard, L. Breslow and A. Milzer.—p. 636.
- Pneumatosis Intestinalis in the Newborn. O. A. Stiennon.—p. 651.
- Correlation of Epileptic Seizures, Electroencephalograms and Emotional State: Some Preliminary Observations in Several Children. I. N. Berlin and C. L. Yeager.—p. 664.

Retrolental Fibroplasia.—Serial ophthalmoscopic examinations were made on 72 premature infants weighing less than 1,650 gm. at birth. The theory of postnatal development of retrolental fibroplasia was supported by the fact that 56 children showed normal fundi at the initial examination. Sixteen infants showed venous caliber increase and arterial tortuosity of the retinal vessels on the first examination, and three of these infants had preretinal or vitreous hemorrhages. Venous caliber increase and venous and arterial tortuosity were later demonstrated in an additional 28 children. In 34 of the 44 infants these early signs of vascular abnormality were followed by preretinal hemorrhages or by extension of the preretinal hemorrhage into the vitreous. One infant showed hemorrhage without antecedent vessel changes. Retrolental fibroplasia developed in 14 of these 35 infants, and in 13 of them there was a consistent pattern of pathogenesis from the first stage of minimal retinal vessel changes through each of five succeeding stages: preretinal hemorrhage, extension of these hemorrhages into the vitreous, organization of the hemorrhages with angiofibrous proliferation, subsequent retinal detachment, and the formation of a retrolental membrane. The importance of preretinal hemorrhage as a precursor of the succeeding stages of retrolental fibroplasia is stressed. The potential reversibility of the developing retrolental process at any stage short of severe retinal detachment is noted. Sixty-five infants were given *dl*-alpha-tocopherol acetate, 50 mg., three times daily, from birth. In 11, retrolental fibroplasia developed in its partial or complete form, challenging the prophylactic role attributed to the tocopherols in treatment of this disease.

Chloramphenicol Treatment of Typhoid.—In 1949 seven children between the ages of 3 and 6 yr. with typhoid were treated with chloramphenicol (chloromycetin®). In all patients the diagnosis was confirmed by blood and stool cultures and agglutination tests. The disease was severe in three patients, moderately severe in three, and relatively mild in one. The dose of the drug ranged from 0.070 to 0.140 gm. per kilogram of body weight every 24 hours. Therapy was given from 10 to 18 days, with an average of 13.9 days. The in vitro sensitivity of the seven strains of S. typhosa recovered from the patients ranged from 2 to 4 γ (micrograms) of chloramphenicol per cubic centimeter. No relapses and no significant toxic reactions to chloramphenicol were observed. Most patients showed a significant drop in total leukocyte and absolute neutrophil counts during therapy. The leukocyte counts rapidly returned to normal after cessation of treatment.

A.M.A. Arch. Dermat. and Syphilology, Chicago

63:545-674 (May) 1951

- Management of Atopic Dermatitis in Children: Control of Maternal Rejection Factor. D. H. Williams.—p. 545.
- Dangers Involved in Dyes, Cosmetics and Permanent Wave Lotions Applied to Hair and Scalp. J. G. Downing.—p. 561.
- Peculiar Nail Anomalies. F. Ronchese.—p. 565.
- *Interdigital Infectious Syphilitic Lesions Simulating Dermatophytosis: Report of 10 Cases. H. T. Dexter.—p. 581.
- Development of Basal Cell Epithelioma as Consequence of Radiodermatitis. N. P. Anderson and H. E. Anderson.—p. 586.
- Treatment of Cutaneous Tuberculosis with Local Injections of Streptomycin. P. D. Foster.—p. 597.
- Treatment of Tinea Capitis with New Antifungal Compound: Preliminary Report. C. Stritzler, I. M. Fishman and S. Laurens.—p. 606.
- Dermatitis with Lipomelanotic Reticular Hyperplasia of Lymph Nodes: Report of 15 Cases. T. C. Laipply and C. J. White.—p. 611.
- Mycologic and Histologic Technics in Study of Superficial Fungous Infections. G. M. Lewis, W. Sachs and M. E. Hopper.—p. 622.

Interdigital Syphilitic Lesions.—Dexter summarizes 10 cases in which the lesions of secondary syphilis resembled dermatophytosis of the feet. One case is of special interest because the interdigital lesions were dark-field positive and responded to penicillin antisyphilitic therapy first with a localized Herxheimer reaction and then with rapid healing. The interdigital lesions in all the cases epithelized and disappeared rapidly after penicillin therapy without any topical medication. Other skin and mucous membrane lesions of a syphilitic type and a positive serological reaction for syphilis with a high titer are significant observations in the differential diagnosis of interdigital lesions. As yet a dark-field positive lesion has not been observed in a seronegative patient. The course and appearance of the interdigital involvement is somewhat different in syphilis and dermatophytosis. In the latter there has usually been chronic scaling and cracking of the skin on the feet and between the toes preceding the onset of the ulceration. The rare case of epidermophytosis with ulcers as extensive as those found in syphilis is accompanied with more edema, erythema, and induration of the surrounding tissues; cellulitis and lymphangitis usually are present. The ulcers of epidermophytosis are less sharply demarcated, shallower, and more irregular in depth; the appearance is that of spotty superficial erosion. The bases are less red. Evidence of scaling and maceration of adjacent tissue is usually found. Lymphadenopathy, if present, is limited to the inguinal nodes of the involved side in contrast to the more generalized lymph node enlargement usually present in secondary syphilis. Interdigital syphilitic lesions showed no increased seasonal incidence, and the patients with these syphilitic lesions did not have occupations that would cause their feet to be either hot or abnormally moist. Most of the patients said they had had no previous attacks of any but minimal epidermophytosis. In five of the cases fungus cultures were made, all of which were negative.

A.M.A. Arch. Neurology and Psychiatry, Chicago

65:413-544 (April) 1951

- Standing Potential Correlates of Hypnosis and Narcosis. L. J. Ravitz.—p. 413.
- Visual and Motor Changes in Patients with Multiple Sclerosis: Result of Induced Changes in Environmental Temperature. T. C. Guthrie.—p. 437.
- Tremor in Parkinson's Disease and Its Inhibition by Amyl Nitrite. O. Garai.—p. 452.
- Deaths Related to Pneumoencephalography During Six Year Period. J. R. Whittier.—p. 463.
- Interaction in Bilaterally Simultaneous Voluntary Motor Function. R. Cohn—p. 472.
- Migraine and Other Head Pain. L. S. Blumenthal and M. Fuchs.—p. 477.
- Assessment of Therapy in Parkinson's Disease. R. S. Schwab and J. S. Prichard.—p. 489.
- New Procedure for Activated Electroencephalography. J. Negrin Jr.—p. 502.
- Improved Technic for Percutaneous Cerebral Angiography: Preliminary Report. D. C. Donald Jr., K. F. Kesmodel Jr., S. L. Rollins Jr. and R. M. Paddison.—p. 508.
- Mechanism of Chvostek's Sign. E. Kugelberg.—p. 511.

The Association library lends periodicals to members of the Association and to individual subscribers in Continental United States and Canada for a period of five days. Three journals may be borrowed at a time. Periodicals are available from 1940 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied with stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted.

A.M.A. Arch. Surgery, Chicago

62:609-736 (May) 1951

Surgical Implications of Upper Thoracic Independent Sympathetic Pathways. E. Ehrlich Jr. and W. F. Alexander.—p. 609.
Clinical Significance of Paraurethral Ducts and Glands. J. W. Huffman. —p. 615.
Successful Resection of Angioendothelioma of Cervical Esophagus: Case Report and Review of Literature. H. K. Palanker, A. B. Constantine and J. R. Paine.—p. 627.
Pheochromocytoma: Anesthetic Management During Surgical Treatment. V. Apgar and E. M. Papper.—p. 634.
Effects of Vagus Section with Subtotal Gastrectomy and Diversion of Duodenal Secretions into Terminal Portion of Ileum on Ulcer Development. J. V. Oliver.—p. 649.
Effect of Vagotomy and Subtotal Gastric Resection on Secretion of Mucin in Human Stomach. G. B. J. Glass, W. L. Mersheimer and C. S. Svigals.—p. 658.
Observations on Major Radicles of Extrahepatic Portal Systems. H. K. Purcell, J. J. Connor, W. F. Alexander and N. M. Scully.—p. 670.
Pain Control Following Upper Abdominal Operations. W. H. Gerwig Jr., C. W. Thompson and B. Blades.—p. 678.
Significance of Postoperative Glycosuria and Ketonuria in Nondiabetic Adults. R. Elman and T. E. Weichselbaum.—p. 683.
•Coronary Thrombosis and Insufficiency Resulting from Shock: Clinical and Pathologic Study. H. A. Davis, V. J. Parlante and A. M. Hallsted. —p. 698.
Metastatic versus Primary Carcinoma of Rectum. H. E. Bacon and J. Laurens.—p. 705.
Total Parotidectomy in Tumors of Parotid Gland. W. S. McCune.—p. 715.
Cerebrovascular Accidents: Surgical Management with Particular Reference to Massive Intracranial Hemorrhage. E. S. Gurdjian and J. E. Webster.—p. 724.

Coronary Thrombosis Following Shock.—In a series of 3,365 cases of coronary thrombosis there were 40 patients with thrombosis apparently precipitated by shock. Eighteen of these, in whom the thrombosis was proved by autopsy, were studied in detail. All but two were over 50, and all but four showed pathological evidence of previous coronary artery disease. Shock was caused by surgical operation or anesthesia in nine patients, by postoperative peritonitis in two, by barbiturate poisoning in three, and by trauma, burns, insulin, and arsenic poisoning in one each. Shock lasted longer than one hour in the majority of patients. Death occurred from one hour to 12 days after the shock episode, with an average time of 68.8 hr. Thrombosis was thought to result from circulatory stasis and, possibly, sludging of blood in the coronary arteries. Transfusion of adequate quantities of blood or plasma, by increasing the output of blood from the left ventricle and augmenting coronary blood flow, should significantly reduce the tendency to coronary thrombosis and insufficiency in shock. This was not done in the majority of patients in this series. The authors conclude that patients over 50 are susceptible to coronary insufficiency as a result of shock and that in these patients any fall in blood pressure should be avoided if possible. If it does occur, it should be treated vigorously and not allowed to persist for more than a few minutes.

American Journal of Medicine, New York

10:405-530 (April) 1951

Lung Function Studies: VI. Detection of Uneven Alveolar Ventilation During Single Breath of Oxygen. J. H. Comroe Jr. and W. S. Fowler. —p. 408.
Effect of Nitroglycerine on Cardiovascular System of Normal Persons. R. Wégria, J. L. Nickerson, R. B. Case and J. F. Holland.—p. 414.
•Natural Course of Rheumatoid Arthritis and Changes Induced by ACTH. J. E. Giansiracusa, M. W. Ropes, J. P. Kulka and W. Bauer.—p. 419.
Rheumatoid Arthritis in the Aged. R. L. Cecil and W. H. Kammerer. —p. 439.
•L. E. (Lupus Erythematosus) Cell: Clinical and Chemical Studies. S. L. Lee, S. R. Michael and I. F. Vural.—p. 446.
Treatment of Leukemia with Aminopterin. L. M. Meyer and A. Newman. —p. 452.
•Continuing Hazard of Bromide Intoxication. H. H. Hodges and M. T. Gilmour.—p. 459.
Criteria for Management of Neurosyphilis. B. Dattner, E. W. Thomas and L. De Mello.—p. 463.
Newer Concepts of Role of Sodium in Disease. T. S. Danowski.—p. 468.

Rheumatoid Arthritis.—The changes induced by corticotrophin (ACTH) in the clinical and laboratory manifestations of rheumatoid arthritis were compared with those occurring during a spontaneous remission in a woman of 21. During both spontaneous and hormone-induced remissions the previous abnormalities in the sedimenation rate, serum proteins, and synovial fluid returned to normal, except that the synovial fluid showed an increased viscosity during corticotrophin administration. Microscopic evidence of a mild synovitis persisted during hormone treatment, as did anemia. Corticotrophin produced prompt but incomplete improvement in all of the clinical manifestations of the disease, but partial or complete withdrawal of the drug was followed by prompt recurrence of both clinical and laboratory manifestations. Hormone therapy was accompanied by many undesirable effects, including acne, hirsutism, moon face, and an acute psychosis.

L. E. Cell.—The diagnostic value of the L. E. cell was confirmed in a study of 22 patients with acute disseminated lupus erythematosus and in a series of patients with diffuse vascular and connective tissue disease. With one exception all the patients with lupus erythematosus showed L. E. cells in bone marrow and peripheral blood. Also with one exception L. E. cells were not found in patients with rheumatoid arthritis, rheumatic fever, dermatomyositis, scleroderma, subacute bacterial endocarditis, blood dyscrasias, lymphoma, or carcinoma. The exception was a patient with amyloidosis of the bone marrow who showed a single L. E. cell that was chemically different from true L. E. cells. The test thus has a sensitivity and a specificity of about 96%. The L. E. cell can be found in clotted blood, so its formation does not depend on the presence of an anticoagulant. The blood must be allowed to stand for at least two minutes after withdrawal from the body before being smeared, and the L. E. cells are most numerous after 20 to 30 min. of incubation. The inclusion body in the L. E. cell is altered nuclear material derived from polymorphonuclear leukocytes and lymphocytes. This material contains partially depolymerized desoxyribose nucleic acid and is identical both optically and chemically with the altered nuclear material found by Klemperer in mesenchymal cells of patients with disseminated lupus erythematosus. The L. E. plasma factor responsible for the production of L. E. cells is found in the gamma globulin fraction of the plasma proteins.

Bromide Intoxication.—The incidence of bromide intoxication continues to be high in spite of numerous warnings to physicians of the hazards of these drugs. Physicians still prescribe bromides without taking adequate precautions against their prolonged use, or patients, unaware of its cumulative toxicity, ignore the advice given. Because of inadequate legislation bromides can be purchased over the counter without a prescription. Symptoms that should suggest the diagnosis are unsteadiness, dizziness, mental confusion, memory loss, and psychotic manifestations in the absence of organic disease. The diagnosis can be easily confirmed by blood bromide determinations. Therapy is simple, and consists of the oral and parenteral administration of large amounts of sodium chloride to hasten the excretion of the bromide ion. Adequate control of this hazard rests with the physician and with legislative bodies.

American Journal of Physiology, Baltimore

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Exchange of Albumin Between Plasma and Lymph. K. Wasserman and H. S. Mayerson.—p. 15.
Changes in Composition of Blood Plasma of Rat During Acute Radiation Syndrome, and Their Partial Mitigation by Dibenamine and Cortin. H. I. Kohn.—p. 27.
Effect of Immaturity, Hypophysectomy and Adrenalectomy upon Changes in Blood Plasma of Rat During Acute Radiation Syndrome. H. I. Kohn.—p. 43.
Adrenal Shielding and Survival of Rats After X-Irradiation. A. Edelmann.—p. 57.
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Reproduction in Vitamin B_{12}-Deficient Rats with Emphasis upon Intrauterine Injury. S. Lepkovsky, H. J. Borson, R. Bouthilet and others. —p. 79.
Some Physiological Effects of Salt Restriction in Rat. H. G. Danford and R. C. Herrin.—p. 128.
Effect of Hypotonic Solutions and Mixtures with Homologous Blood on Peripheral and Coronary Blood Flow. M. M. Winbury, D. A. Beach and P. M. Michiels.—p. 135.
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Mobilization of Red Cells and Oxygen from Spleen in Severe Hypoxia. K. Kramer and U. C. Luft.—p. 215.

American Journal of Psychiatry, New York

107:721-800 (April) 1951

- Inadequacy of Present-Day Concepts of Mental Deficiency and Mental Illness in Child Psychiatry. C. E. Benda, M. J. Farrell and C. E. Chipman.—p. 721.
- Selective Cortical Undercutting: Results in New Method of Fractional Lobotomy. W. B. Scoville, E. K. Wilk and A. J. Pepe.—p. 730.
- Research in Private Practice. F. Dunbar.—p. 739.
- Prophylactic Electroshock: Five-Year Study. G. H. Stevenson and J. J. Geoghegan.—p. 743.
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- Lymphocytic and Eosinophilic Reaction to Electric Shock Treatment. N. Raskin, G. Howard and S. Singer.—p. 758.
- Individual Reactions to Community Disaster: Natural History of Psychiatric Phenomena. J. S. Tyhurst.—p. 764.
- Psychiatric Facilities in Cincinnati. L. A. Lurie.—p. 770.
- Therapeutic Results and Clinical Manifestations Following Use of Tetraethythiuram Disulfide (Antabuse). G. P. Child, W. Osinski, R. E. Bennett and E. Davidoff.—p. 774.
- Emotional Aspects of Cardiac Disease. M. F. Reiser.—p. 781.

107:801-880 (May) 1951

- *Some Experiences with Transorbital Leucotomy: Review of Results in 110 Cases. M. T. Moore and N. W. Winkelman.—p. 801.
- *Impaired Cerebral Functions in Essential Hypertension. N. S. Apter and W. C. Halstead.—p. 808.
- Electronarcosis in General Hospital. M. M. Estes and H. M. Cleckley. —p. 814.
- Decamethonium Bromide (C-10) in Electric Convulsive Therapy. W. Holt, M. Rinkel, M. Nicholson and H. C. Solomon.—p. 821.
- Phenurone in Treatment of Psychomotor Attacks. R. N. DeJong.—p. 825.
- Clinical Evaluation of Tetraethylthiuramdisulphide (Antabuse) in Treatment of Problem Drinkers. K. M. Bowman, A. Simon, C. H. Hine and others.—p. 832.
- Influence of Subcortical (Diencephalic) Brain Lesions on Emotionality as Reflected in Rorschach Color Responses. V. A. Kral and H. Dörken Jr.—p. 839.
- Comments on Psychopathology of Children with Somatic Illness. S. A. Szurek.—p. 844.
- Preliminary Report on Use of D-Desoxyephedrine Hydrochloride in Study of Psychopathology and Psychotherapy. J. Schein and P. Goolker. —p. 850.
- Hallucinations in Migraine. C. W. Lippman.—p. 856.
- Psychiatric Aide Selection Through Psychological Examinations: Preliminary Report of Screening of Applicants at Arkansas State Hospital. E. M. Barron and H. H. Donohue.—p. 859.
- Peptic Ulcer—Facts and Assumptions. E. Kahn and F. A. Freyhan. —p. 866.

Experiences with Transorbital Leukotomy. — Seventy-eight female and 32 male patients between 14 and 70 with various mental disorders were subjected to 127 transorbital leukotomies. Seventy-four patients had schizophrenia; 19 had psychoneuroses; 14 had affective psychoses; two had paranoid psychosis, and one had mental deficiency with paranoia. The schizophrenic patients had received the accepted forms of treatment without relief and were considered hopeless, but 39 of them (53%) showed improvement following transorbital leukotomy. Catatonic and paranoid types of schizophrenia responded most favorably in this category, whereas the deteriorating forms showed a low improvement rate. If agitation was a significant feature of the deteriorated type, improvement was obtained after transorbital leukotomy. Among the obsessive-compulsive patients previously subjected to psychotherapeutic techniques and electric convulsive treatment, transorbital leukotomy effected improvement in 16 (84%). Improvement was slow initially but increased with time. The patients with affective psychoses in whom repeated courses of shock therapy had failed to prevent recurrences, particularly those with agitated depressions, responded very favorably to transorbital leukotomy, with five of six manic-depressive patients (83%) and five of eight with involutional depression (63%) improved. Transorbital leukotomy is a comparatively rapid, simple procedure that can be done by a psychiatrist without elaborate equipment or facilities. It has the great advantage over the former methods of lobotomy that it produces no untoward psychological effects. In view of the relative ease of performance, short hospitalization, minimal nursing care, insignificant morbidity, low mortality rate (1.8%), and the favorable results, the authors suggest that this procedure be utilized more widely in suitable cases, so that patients are not unnecessarily relegated to custodial institutions for life or permitted to lead a burdensome existence.

Impaired Cerebral Function in Essential Hypertension.—The effects of relatively early and minimal cerebral damage on the personality patterns and adaptive capacities of 14 patients between 27 and 58 with essential hypertension were studied by combined medical, neurological, experimental psychological, and psychiatric techniques. A psychiatric syndrome characterized by changes in personality patterns, especially in relation to the expression of hostility, the willingness to yield to dependent needs, and reduction in perfectionistic drives, associated with mild judgmental and memory defects, insomnia, loss of energy, and anxiety symptoms that are not explainable by changes in the cardiovascular status, has been observed. The appearance of this syndrome signifies the onset of organic involvement of the brain. The duration of the syndrome depends not so much on the quantitative aspects of the cerebral damage as on the integrative ability of the premorbid personality. Impairment of cerebral function equivalent to that seen in patients with surgical removal of both frontal lobes may occur early in the course of essential hypertension without neurological signs. Neuropathological evidence points to diffuse involvement of the nervous system. The syndrome provides further information regarding the clinical course of hypertension. The mechanisms by which the cerebral damage occurs require further elaboration. The occurrence of symptoms and of alterations in the adaptive capacities in the absence of neurological signs suggests that the changes are biochemical or vasomotor rather than structural.

Am. Practitioner & Digest of Treatment, Philadelphia

2:305-392 (April) 1951

- Treatment of Infectious Mononucleosis. R. E. Kaufman.—p. 305.
- Intensity and Duration of Effect of Depo-Heparin on Venous Coagulation Time in Man. N. H. Moss and D. R. D'Alessandro.—p. 309.
- Autonomic Blocking Agents in Treatment of Peripheral Arterial Vascular Diseases. R. H. Mitchell, A. H. Rutledge and E. Davenport.—p. 311.
- Treatment of Syphilis. N. Epstein.—p. 317.
- Hemoglobinurias. A. S. Glushien.—p. 320.
- Acute Rheumatic Fever in Uncommon Sites. N. E. Reich.—p. 328.
- Hyperparathyroidism. H. M. Rogers.—p. 332.
- Counseling the Overweight Patient. A. P. Hudgins.—p. 336.
- Sarcoidosis Complicated by Spontaneous Pneumothorax. B. R. Gendel and E. F. Luton.—p. 339.
- Emergency Care, Handling and Transportation of the Injured and Its Importance in the Community. C. B. Young Jr.—p. 341.
- Histamine and Antihistamine Drugs in Allergic Diseases. E. B. Brown. —p. 347.

Angiology, Baltimore

2:85-140 (April) 1951

- Clinical Anatomy of Lesser Variations of Inferior Vena Cava; and Proposal for Classifying Anomalies of This Vessel. E. A. Edwards.—p. 85.
- Studies in Experimental Frostbite: VI. Effect of Rutin and Benadryl with Some Notes on Plaster Casts and Role of Edema. H. B. Shumacker Jr., L. R. Radigan, H. H. Ziperman and R. R. Hughes.—p. 100.
- Arteriovenous Fistula as Treatment in Arterial Hypertension. F. Martorell.—p. 110.
- *Evaluation of Some Dihydrogenated Alkaloids of Ergot in Management of Chronic Peripheral Vascular Diseases. R. J. Popkin.—p. 114.
- Use of Electroretinography in Measuring Effect of Vasodilation. H. E. Henkes.—p. 125.
- Thrombo-Angiitis Obliterans in Women: Report of Case. R. L. Fisher, M. Zukerman and D. N. Sweeny Jr.—p. 132.
- Bicycle Exercises and Deep Breathing in Prevention of Thrombosis. C. Moses.—p. 138.

Peripheral Vascular Disease.—Although crude ergot produces spasm of blood vessels, it also has a latent sympatholytic effect. This effect becomes dominant when the alkaloids of ergot are hydrogenated, and these compounds then become vasodilators. They act centrally by inhibiting the vasomotor center and peripherally by opposing the action of epinephrine. Popkin used the dihydrogenated alkaloids of ergot (dihydroergocornine, dihydroergocristine, and dihydroergokryptine) in an equimixture known as CCK 179 for the treatment of 250 patients with peripheral vascular disease and obstructive edema. This preparation was given parenterally and by mouth in a dose that varied with the response of the patient. Statistically significant improvement was noted in over 60% of the cases followed for approximately two years. Patients with organic occlusive arterial diseases showed the greatest improvement, as evidenced by increased skin temperature, accelerated adaptation to cold, improved healing of ulcers, and decreased rest pain, walking pain, paresthesias, and nocturnal cramps. Vasospastic disorders were rarely benefited. Edema due to thrombophlebitis, posttraumatic causalgia, or venous obstruction was improved. Phantom limb pain was benefited in one case. Toxic or uncomfortable side reactions were rare. More than 25% of the older patients reported an increased sense of well-being while taking this preparation, presumably due to an increase in cerebral circulation, pulmonary ventilation, and skin temperature.

Annals of Western Medicine & Surgery, Los Angeles

5:261-332 (April) 1951

Present Status of Artificial Homeostasis (Organ Substitution and Massive Blood Transfer). P. F. Salisbury.—p. 261.
Value of Excision Biopsy in Breast Tumors. R. M. Neale.—p. 272.
*Surgical Treatment of Duodenal Ulcer. G. A. Stevens, C. S. Kipen and W. L. Ross.—p. 275.
Intussusception Anastomosis as Emergency Surgical Procedure. B .H. Sprague and L. Adams.—p. 279.
Culdoscopy in Gynecology. W. B. McGee and J. P. Fick.—p. 282.
Differential Diagnosis of Small Bowel Obstructions. M. C. Todd.—p. 285.
Legal Authorization for Autopsy. L. J. Regan.—p. 287.

Treatment of Duodenal Ulcer.—Three types of operations were used in 132 cases of duodenal ulcer here reviewed. In 43 cases so-called complete vagotomy was done, with or without supplemental gastroenterostomy; in 47 cases the operation was conventional gastric resection, and in 42 the procedure was hemigastrectomy and so-called subtotal vagotomy, recently described by Stevens. A two year follow-up study revealed that results of gastric resection and hemigastrectomy with subtotal vagotomy were better than results of vagotomy procedures alone. The authors believe that the anticholinergic drug beta-diethylaminoethylxanthene-9-carboxylate methobromide (banthine®) is less effective than vagotomy in the treatment of peptic ulcer. The action of banthine® differs in at least two respects from the result of vagotomy: 1. It reduces total gastric secretion but does not materially decrease titratable acidity. 2. It does not prevent the acid response to insulin hypoglycemia. It has been observed that whereas banthine® bromide is a useful adjunct in the medical treatment of duodenal ulcer, the drug has not materially affected the course of the disease in the type of patient for whom surgery has been indicated heretofore. Although initial reports on the use of this drug in the treatment of peptic ulcer have been encouraging and the results have been compared with those of vagotomy, discrepancies in clinical and laboratory results are already evident. The authors of this report found among patients referred for surgery by internists one case each of recurrent hemorrhage, recurrent intractable pain, and perforation following intensive banthine® therapy.

Arizona Medicine, Phoenix

8:1-76 (April) 1951

Treatment of Chest Emergencies—Medical Aspects. R. O. Egeberg.—p. 25.
Climate and Rheumatic Diseases. H. E. Thompson.—p. 31.
Ball Thrombus of Mitral Valve. A. L. Lieberman.—p. 34.

8:1-76 (May) 1951

Expanded Use of Streptomycin and PAS. W. H. Oatway Jr. and F. Reding.—p. 26.
Jaundice. P. Thorek.—p. 32.
Incidence of Trichinella Spiralis Infections in Asymptomatic Group, as Indicated by Kline Test. R. A. Greene and E. L. Breazeale.—p. 36.

Delaware State Medical Journal, Wilmington

23:79-104 (April) 1951

Use of Fat in Weight Reducing Diet. A. W. Pennington.—p. 79.
Cancer of Laryngopharynx: Radical Surgical Resection Combined with Neck Dissection and Esophagoplasty: Preliminary Report. J. F. Hynes. —p. 86.
*Spontaneous Hemopneumothorax: New Concepts in Treatment. G. A. Beatty and R. W. Frelick.—p. 93.
Right Upper Mediastinal Lesion. P. A. Shaw.—p. 97.
Primary Hepatoma: Case Report and Brief Discussion of Disease. A. Iddles.—p. 99.

Treatment of Spontaneous Hemopneumothorax.—The patient with spontaneous hemopneumothorax whose case is reported showed no improvement with routine conservative management. On the third day his dyspnea and orthopnea were severer and x-rays showed increased fluid in his chest. Despite a blood transfusion of 500 cc. the patient seemed to be in borderline shock. Plasma was started, and another chest film and other tests indicated continued bleeding in the left side of the chest. After 1,500 cc. of blood had been removed, an exploratory thoracotomy was done. There was oozing of blood from adhesions in the apex and the left costophrenic angle. The bleeding was controlled by ligatures to the adhesions and by the use of multiple absorbable gelatin sponge (gelfoam®) packs. The postoperative course was smooth. The rapid recovery of this patient is contrasted with the prolonged course of two others who were treated conservatively and who eventually required pulmonary decortication. In a fourth patient conservative therapy also resulted in prolonged hospitalization, and despite subsequent operations this patient died. The authors advise exploratory thoracotomy in cases of massive bleeding not controlled by conservative measures, and they recommend early decortication if conservative procedures have not been successful in producing pulmonary expansion. Thoracotomy was first considered the treatment of choice for almost all cases of hemopneumothorax, but now with streptokinase and streptodornase for prevention of clot formation in the chest, the authors feel that these drugs should be used in connection with the conservative measures. They must be used with caution, however, for if used too early, they may add to the initial bleeding tendency.

Georgia Medical Association Journal, Atlanta

40:157-200 (April) 1951

The Physician's Responsibility. A. M. Phillips.—p. 157.
Presentation of the President's Gold Key to Alpheus Maynard Phillips. C. H. Richardson Sr.—p. 163.
Management of Ureteral Obstruction in Children. P. L. Scardino.—p. 164.
Bladder Dysfunction Due to Congenital Defects (Bladder Neck Obstruction and Neurogenic Bladder) in Children. J. R. Rinker and T. Everett. —p. 170.
Use of Radioactive Iodine in Diagnosis and Treatment of Diseases of Thyroid. C. M. Huguley Jr.—p. 173.
Folic Acid Antagonists in Treatment of Acute and Subacute Leukemia. M. H. Freedman.—p. 177.
Pulmonary Sarcoidosis. R. M. Tankesley.—p. 180.
Value of Cervical Smear as Routine Office Procedure. C. G. Bellville. —p. 184.

GP (J. Am. Acad. Gen. Practice), Kansas City, Mo.

3:1-178 (April) 1951

Diverticulosis and Diverticulitis of Colon. J. D. Enterline.—p. 35.
The Fight Against Tuberculosis. J. A. Myers.—p. 39.
Hemolytic Ictero Anemia. W. F. Benson.—p. 49.
The Child Who Wets the Bed. J. V. Braithwaite.—p. 53.
Prescription Writing for Skin Ailments. H. Goodman.—p. 63.
Intervertebral Disc Syndrome. C. Rombold.—p. 67.
Diabetic Coma. G. G. Duncan.—p. 70.

Indiana State Medical Assn. Journal, Indianapolis

44:269-352 (April) 1951

*Difficult Diagnosis of Early Gastric Cancer. E. A. Lawrence.—p. 289.
Pneumonitis Complicating Cancer of Lung. R. B. Sanderson and J. M. Wilson.—p. 292.
Carcinoma of Breast. F. W. Taylor.—p. 297.
Skin Cancer. S. R. Mercer and D. J. McNairy.—p. 300.
Sarcoma Arising in Paget's Disease of Bone and Malignant Transformation in Mixed Tumor of Salivary Gland: Case Report. E. P. Kintner. —p. 304.
Carcinoma of Biliary Tract. J. S. Battersby.—p. 307.

Diagnosis of Early Gastric Cancer.—Cancer of the stomach causes more than 25,000 deaths each year in the United States, more than any other type of carcinoma. In discussing gastric cancer, Lawrence gives particular attention to early *diagnosis.* A patient with dyspepsia and in whom gastric cancer is suspected should have a stool examination for occult blood after a three-day period on a meat-free diet, a gastric analysis, and a complete blood cell count. If either the stool is positive for blood or the gastric acidity is abnormally low, then a complete gastrointestinal examination should be made, including gastroscopy and a cytological examination of the gastric contents for malignant cells. Every patient with suspected gastric carcinoma should be operated on, unless distant metastases are demonstrated, and every carcinoma found at operation should be resected if this is technically possible. Gastric polyps are premalignant lesions.

Gastric carcinoma is so frequently associated with pernicious anemia that this also may be considered a premalignant disorder. The prognosis after a successful gastrectomy for early carcinoma is excellent.

Journal of Applied Physiology, Washington, D. C.

3:573-636 (April) 1951

- Stimulation and Inhibition of Human Sweat Glands by Intradermal Sympathomimetic Agents. R. R. Sonnenschein, H. Kobrin, H. D. Janowitz and M. I. Grossman.—p. 573.
- Mechanical Impedance of Surface of Human Body. E. K. Franke.—p. 582.
- Physiological Responses of Men to Chilling in Ice Water and to Slow and Fast Rewarming. A. R. Behnke and C. P. Yaglou.—p. 591.
- Effect of Prehydration upon Renal Excretion of Sodium in Man. M. Ladd. —p. 603.
- Effects of Epinephrine on Normal, Hypertensive and Denervated Renal Vascular Systems in Man. D. W. Koza, F. J. Kottke and M. Olson. —p. 610.
- *Tobacco Smoking and Physical Performance. P .V. Karpovich and C. J. Hale.—p. 616.
- Act of Deglutition: Cinefluorographic Study. R. F. Rushmer and J. A. Hendron.—p. 622.
- Electro-Potential Changes in Human Urinary Bladder: Method of Measurement. E. L. Corey, W. H. Boyce, S. A. Vest and C. R. French. —p. 631.

Tobacco Smoking and Physical Performance.—Knowledge regarding the effect of tobacco smoking on athletic performance is inadequate. It is possible that there may not be any uniformity in the effect of smoking on different persons, because of several variables, e. g., individual differences, amount of smoke inhaled, speed of smoking, and frequency of smoking. The investigations reported in this paper involve two series of experiments. Thirteen college students were used as subjects, eight of them habitual smokers and five nonsmokers. The subjects performed on a bicycle ergometer a prescribed amount of work, comparable to a one-mile run on the track, in the shortest possible time. Each subject served as his own control, by either smoking or abstaining from smoking. The period of abstinence from smoking was from seven to 10 days. The average riding time for all subjects but one was better when they did not smoke. This, however, was statistically significant for only three smokers and two nonsmokers and was not significant for the group. Abstinence from smoking for one week caused improvement in a tobacco-sensitive subject, and no effect in nonsensitive ones. Reports made by the subjects regarding how they felt before and during the rides had no apparent connection with their performances. Since a relatively large proportion of an athletic team may consist of tobacco-sensitive men, the nonsmoking rule is a wise precaution.

Journal of Clinical Investigation, Cincinnati

30:345-434 (April) 1951

- Effect of Intravenous Infusions of Physiologic Saline Solution on Pulmonary Arterial and Pulmonary Capillary Pressure in Man. J. T. Doyle, J. S. Wilson, E. H. Estes and J. V. Warren.—p. 345.
- *Comparison of Intracardiac and Intravascular Temperatures with Rectal Temperatures in Man. L. W. Eichna, A. R. Berger, B. Rader and W. H. Becker.—p. 353.
- Immunophysiology of Serum Sickness: Alterations in Blood Volume and Thiocyanate Space in Relation to Devolopment of Humoral Antibodies in Rabbit. J. K. Aikawa and G. T. Harrell.—p. 360.
- Intracellular Cation Exchanges in Metabolic Alkalosis. J. R. Elkinton, R. D. Squires and A. P. Crosley Jr.—p. 369.
- Intracellular Cation Exchanges in Acidosis Due to Renal Insufficiency: Effects of Alkali Therapy. J. R. Elkinton, R. D. Squires and R. B. Singer.—p. 381.
- Lipids of Serum in Pregnancy. J. P. Peters, M. Heinemann and E. B. Man.—p. 388.
- Biological Activity of Flavonoid (Vitamin "P") Compound. B. Sokoloff, W. H. Eddy and J. B. Redd.—p. 395.
- Cardiac Output in Postural Hypotension. J. B. Hickam and W. W. Pryor. —p. 401.
- Quantitative Determination of Visceral Pain Threshold in Man: Characteristics of Visceral Pain, Effect of Inflammation and Analgesics on Threshold, and Relationship of Analgesia to Visceral Spasm. E. A. Gaensler.—p. 406.
- Renal Function and Electrolyte Metabolism in Acute Glomerulonephritis. D. P. Earle, S. J. Farber, J. D. Alexander and E. D. Pellegrino.—p. 421.

Intracardiac and Rectal Temperatures.—Whereas the temperature of the peripheral tissues may vary widely in man, the temperature of the deep tissues, or of a critical deep tissue, remains fairly constant under widely varying conditions. The location of the critical deep tissue, whose temperature probably determines that of other tissues, is not known, but there is much evidence that it is in the diencephalon. While rectal temperature has been considered to be a good index of deep and critical tissue temperatures, it often appears to be unsatisfactory, as indicated by the onset of such compensating mechanisms as peripheral vasodilatation and sweating before a rise in rectal temperature has occurred, and, conversely, in subjects who are cooled, the presence of vasoconstriction and pilomotor activity before a fall in rectal temperature. Measurements of the temperature in the right side of the heart and in the deep vessels leading to this part of the heart, in the femoral artery, and in the rectum of 24 afebrile subjects showed that 1. There is a gradient of increasing temperature in the larger veins as they approach the heart. 2. Temperatures within the right side of the heart and pulmonary artery are equal. 3. Rectal temperature exceeds intracardiac and deep intravascular temperatures by a small but significant amount. 4. Temperatures in the veins draining the liver and brain are higher than the temperatures in the veins into which they drain, and they equal rectal temperature. The differences between rectal and intracardiac temperatures are not large enough to be of clinical importance in afebrile subjects, but preliminary observations suggest that during fever rectal temperature may exceed intracardiac temperature by up to 0.8 C. The data suggest a further study on rectal temperature in relation to the average deep tissue temperature and the temperature of the critical tissue that initiates thermoregulating mechanisms.

Journal of Investigative Dermatology, Baltimore

16:201-294 (April) 1951

- Adaptation of Low Power Pocket Microscopes for Cutaneous Examination. W. W. Lyon.—p. 201.
- *Cutaneous Side Effects of ACTH, Cortisone and Pregnenolone Therapy. M. J. Brunner, J. M. Riddell Jr. and W. R. Best.—p. 205.
- Simulation of Lupus Erythematosus Phenomenon by Materials of Fungal Origin. J. R. Haserick.—p. 211.
- Studies on Ether-Soluble Substances on Human Skin: I. Quantity and "Replacement Sum." F. Herrmann and P. H. Prose.—p. 217.
- Studies on Life Cycle of Spirochetes: VIII. Summary and Comparison of Observations on Various Organisms. E. D. DeLamater, M. Haanes, R. H. Wiggall and D. M. Pillsbury.—p. 231.
- Chromatin-Melanin Relationships in Malignant Melanomata. E. Meirowsky and L. W. Freeman.—p. 257.
- Comparative Studies in Treatment of Acne Vulgaris Utilizing Intraderm Sulfur and Intraderm Tyrothricin. R. O. Noojin and J. W. Sewell. —p. 261.
- Comparative Study on Effect of Anticholinergic Compounds on Sweating. W. B. Shelley and P. N. Horvath.—p. 267.
- Characterization of Pigment Produced by Microsporum Fulvum in Casein Hydrolysate Medium. S. A. M. Johnson and J. S. Reedal.—p. 275.
- Dermatologic Aspects of Electron Microscopy. C. D. Baldridge, H. Blank and G. Rake.—p. 281.

Cutaneous Effects of ACTH and Similar Steroids.—Although corticotrophin (ACTH), cortisone, and similar steroids improve at least temporarily certain skin conditions, such as lupus erythematosus, pemphigus, dermatomyositis, and exfoliative dermatitis, which were previously resistant to therapy, side effects, in the form of moon face, hirsutism, pigmentation, and acne, develop in patients treated for long periods with large doses of these hormones. Of 105 patients treated by Brunner and associates with these hormones, hyperpigmentation developed in 29, acne in 26, hypertrichosis in 12, seborrheic dermatitis in 3, and oiliness of the skin in several others. Thus, side effects indicating androgenic stimulation of cutaneous structures developed in a substantial proportion of the cases. Although there have been a variety of theories as to the cause of acne vulgaris and of seborrheic dermatitis, there is now much evidence pointing to androgenic hormones as causative factors.

Journal Nat. Cancer Inst., Washington, D. C.

11:463-662 (Dec.) 1950

- Mechanism of Cancer Induction by Ultraviolet Radiation. H. F. Blum —p. 463.
- Pulmonary Carcinoma Revealed at Necropsy, with Reference to Increasing Incidence in the Los Angeles County Hospital. P. E. Steiner, E. M. Butt and H. A. Edmondson.—p. 497.
- Effects of Roentgen Rays on Cancer: I. Direct Microscopic Observations on Living Intraocular Transplants of Frog Carcinoma. B. Lucké and H. G. Schlumberger.—p. 511.
- Studies on Infectivity of Mouse Mammary Tumor Agent. H. B. Andervont.—p. 545.
- Vascular Reactions of Normal and Malignant Tissues in Vivo: III. Vascular Reactions of Mice to Fibroblasts Treated in Vitro with Methylcholanthrene. G. H. Algire, H. W. Chalkley and W. R. Earle.—p. 555.

J. Neuropathology & Exper. Neurology, Baltimore

10:109-228 (April) 1951

Dystrophia Myotonica and Myotonia Congenita: Histopathologic Studies with Special Reference to Changes in Muscles. G. Wohlfart.—p. 109.
Hallervorden-Spatz Disease and Dystonia. M. G. Netsky, D. Spiro and H. M. Zimmerman.—p. 125.
*Experimental Congenital Toxoplasmosis: V. Lesions in Offspring of Mice Infected with Toxoplasma by Vaginal Route. Observations on Associated Hepatic Injury. D. Cowen and A. Wolf.—p. 142.
Paralysis Caused by Penicillin Injection: Mechanism of Complication—Warning. I. M. Tarlov, I. Perlmutter and A. J. Berman.—p. 153.
Comparative Morphologic and Histometabolic Studies of Nerve Cells in Brain Biopsies and Topectomies. L. Roizin.—p. 177.
Effect of Morphine on Cats with Hypothalamic Lesions. W. R. McCrum and W. R. Ingram.—p. 190.
Extraventricular and Intra-Cerebellar Papilloma of Choroid Plexus. R. C. Greene.—p. 204.
Torula Meningoencephalitis. J. H. Globus, K. M. Gang and P. S. Bergman.—p. 208.

Toxoplasmosis in Offspring of Infected Mice.—The introduction of Toxoplasma into the vaginal canal of the mouse causes local toxoplasmic vaginitis, followed by parasitemia and involvement of the peripheral maternal tissues and placenta. Parasites enter the fetal circulation from the placenta late in gestation and eventually produce disseminated lesions in the surviving offspring. Of 717 young mice studied histologically, 91 proved to have congenital toxoplasmosis. Lesions of toxoplasmosis appeared on the ninth postnatal day or later. They were hematogenous and similar to those observed in human congenital toxoplasmosis. The central nervous system was almost invariably affected, the lungs only slightly less often, and the heart and other tissues rarely. Large zones of inflammation, necrosis, and calcification in the brain, associated with a proliferation of Toxoplasma, duplicated features typical of the human disease. The infection reached its greatest intensity toward the end of the third week of life. As in human infantile toxoplasmosis, animals surviving the first phases of the disease showed evidence of healing or resolution of their lesions and a reduction or disappearance of Toxoplasma in histological sections. However, Toxoplasma sometimes persisted in the brain for long periods, in one instance for 78 days. Many of the animals had an unusual form of hepatic degeneration characterized by severe fatty infiltration, atrophy, and necrosis of liver cells at the free margins and adjacent portions of the surface. The hepatic lesions were not due to a growth of parasites in the liver but were possibly the result of a secondary metabolic disturbance or nutritional deficiency intensified by the generalized toxoplasmic infection.

Journal of Nutrition, Philadelphia

43:459-580 (April) 1951. **Partial Index**

Excretion of CA^{45} into Gastrointestinal Tract of Young and Mature Rats. H. D. Wallace, R. L. Shirley and G. K. Davis.—p. 469.
Effect of X-Irradiation upon Fat Absorption in Mouse. J. F. Mead, A. B. Decker and L. R. Bennett.—p. 485.
Influence of Folic Acid, Vitamin B_{12}, and Methyl Donors on White Blood Cell Production in Rats. J. S. Dinning, L. D. Payne and P. L. Day.—p. 525.
Studies to Determine Nature of Damage to Nutritive Value of Some Vegetable Oils from Heat Polymerization: I. Relation of Autoxidation to Decrease in Nutritional Value of Heated Linseed Oil. E. W. Crampton, R. H. Common, F. A. Farmer and others.—p. 533.
Apparent Digestibility of Essentially Similar Diets by Rats, Guinea Pigs, Sheep, Swine and by Human Subjects. E. W. Crampton, M. I. Irwin, L. E. Lloyd and H. R. Neilson.—p. 541.
Dental Caries in Cotton Rat: XII. Natural Versus Refined Sugars. M. A. Constant, P. H. Phillips and C. A. Elvehjem.—p. 551.
*Effect of Aureomycin on Response of Rats to Various Forms of Vitamin B_6. H. Linkswiller, C. A. Baumann and E. E. Snell.—p. 565.

Aureomycin and Vitamin B_6.—Rats fed pyridoxal or pyridoxamine incorporated into the basal ration grew less than rats fed equimolar amounts of pyridoxine. The addition of vitamin B_{12} to the basal ration did not alter the relative activities of the three forms of vitamin B_6. Aureomycin increased the growth of rats fed low levels of pyridoxine. It caused a decided increase in the growth of rats fed limiting amounts of pyridoxal or pyridoxamine. In the presence of the antibiotic the three forms of vitamin B_6 were approximately equal in growth-promoting activity. Aureomycin may act to prevent utilization or destruction of the growth-promoting nutrient vitamin B_6 by intestinal micro-organisms, thus increasing the amount available to the rat, and a similar action directed toward other known and possibly unknown food factors may explain in part the growth-promoting effects of antibiotics in crude rations.

Medical Annals of District of Columbia, Washington

20:181-242 (April) 1951

Medicine and Medical Education. E. L. Henderson.—p. 181.
Rapid Infusions of Invert Sugar. J. J. Weinstein and G. F. Lane.—p. 186.
Amygdaloidectomy for Suppression of Auditory Hallucinations: Preliminary Report of Theory and Its Application in One Case. J. M. Williams and W. Freeman.—p. 192.
Biosynthesis and Pharmacology of Radioactive Digitalis and Other Medicinally Important Drugs. E. M. K. Geiling.—p. 197.
*Value of Antabuse as Adjunct Therapy for Alcoholism. L. E. Wexberg, A. M. Zappala and S. A. Steiner.—p. 202.
Relationship of Hobbies to Health. W. T. Gibb Jr.—p. 205.

20:243-296 (May) 1951

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Diagnosis of Radiation Injury as Produced by Atomic Bombs. E. P. Cronkite.—p. 248.
Public Health Problems in Civil Defense. D. L. Seckinger and W. H. Cary Jr.—p. 252.
Hospital Plan for Major Disaster. M. Flocks, W. G. Sorrell and T. R. Pinckney.—p. 256.
Police and Traffic Problems in Atomic Disaster. J. E. Fondahl.—p. 261.
Fire Department Problems and Their Relation to Medical Effort in Atomic Warfare. J. H. Mattare.—p. 263.
Inversion of AVR and Other Leads of Frontal Electrocardiogram: Preliminary Report. W. Welsh.—p. 265.

Antabuse in Alcoholism.—Wexberg and associates discuss the use of antabuse (tetraethylthiuram disulfide) as an adjunct in the rehabilitation of alcoholics and stress that the patient must have at least average intelligence and must realize the risk he incurs should he return to drinking alcohol while taking antabuse. The patient's intelligence and motivation should be ascertained by psychological tests (e. g., Rorschach and thematic apperception tests). Psychiatric inquiry should also be used. This covers the patient's early history, social adaptability, educational level, work status, marital relations, religious background, and the development of the drinking problem. A complete physical survey is also needed and should include electroencephalogram, electrocardiogram, test of basal metabolic rate, liver and kidney function studies, and a glucose tolerance test. Contraindications to the use of antabuse are diabetes mellitus, cirrhosis of the liver, chronic or acute nephritis, myocardial failure, coronary sclerosis, pregnancy, epilepsy, and exophthalmic goiter. The patient must not drink for four or five days before antabuse is given. The first dose of the drug is 2 gm. This is decreased by half a gram each day to the maintenance dose of about 0.75 gm. The drug is given daily before breakfast. On the eighth day of treatment the patient is given 15 cc. of 90-proof whiskey every 15 min. After about three doses a reaction follows, the peak of which is reached in 30 to 60 min. The first and second tests with alcohol should be made in a hospital. Should the antabuse-alcohol reaction be too severe, 1,000 cc. of 5 per cent glucose in isotonic sodium chloride solution with 1,000 mg. of ascorbic acid should be given intravenously. Ephedrine, 24 mg., should be given intravenously if the blood pressure drops alarmingly. So that possible insidious toxic effects of the drug may be discovered, complete blood cell count, liver function studies, basal metabolic rate determination, and urinalysis should be done at frequent intervals.

Michigan State Medical Society Journal, Lansing

50:345-440 (April) 1951

Clinical Importance of "Early Cancer." J. R. McDonald and L. B. Woolner.—p. 377.
Progress in Cancer Research. J. R. Heller Jr.—p. 384.
What Is a Practical Cancer Detection Program? F. L. Rector.—p. 388.
Virus as Cause of Human Cancer. J. E. Gregory.—p. 391.
Parotid Gland Tumors and Their Surgical Management. R. W. McNealy and J. W. McCallister.—p. 398.
Physical Examinations in Industry as Cancer Case Finding Procedures. C. D. Selby.—p. 402.
Cancer Control in Michigan. A. E. Heustis.—p. 404.
Register in Michigan Cancer Program. C. J. Poppen.—p. 406.
Hillsdale Plan for Tumor Detection: Three Year Survey. A. W. Strom.—p. 407.

Minnesota Medicine, St. Paul

34:281-388 (April) 1951

Pathology of Ionizing Radiation. E. de Coursey.—p. 313.
Medical Aspects of Atomic Warfare as Related to Civilian Defense. J. M. Ryan.—p. 317.
Unusual Pyodermas (Hidrosadenitis Suppurativa, Acne Conglobata, Dissecting Cellulitis of Scalp): Review. R. R. Kierland.—p. 319.
Effect of Vitamin K_1 Administered Orally on Control of Coagulation Defect Induced by Dicumarol. B. F. Fuller and N. W. Barker.—p. 326.
Congenital Auricular Fistula. B. Bofenkamp.—p. 329.
Intravenous Analgesia and Amnesia in Obstetrics. F. L. Schade.—p. 331.
Impressions from European Neurosurgical Clinics. L. A. Titrud.—p. 333.

Nebraska State Medical Journal, Lincoln

36:113-156 (April) 1951

Problem of Scoliosis—Its Evaluation, Treatment and Prognosis. F. S. Webster.—p. 115.
Massive Hemorrhage from Upper Gastro-Intestinal Tract. O. A. Brines.—p. 120.
Current Therapy of Venereal Diseases. A. C. Andersen.—p. 122.
Middle Lobe Syndrome. S. E. Potter.—p. 125.
Infectious Diarrheas: Part II. Some Bacteriological and Epidemiological Aspects. H. W. McFadden Jr. and M. F. Gunderson.—p. 127.

36:157-188 (May) 1951

Case Report of True Non-Parasitic Cyst of Spleen. R. H. Whitham, R. O. Garlinghouse, F. H. Tanner and S. F. Moessner.—p. 159.
Hypofunction of Adrenal Cortex in Infancy. D. A. Petersen and J. M. Thomas.—p. 162.
Compound Volvulus Complicating Pregnancy. H. D. Hilton and K. T. McGinnis.—p. 165.
Cleft Palate. W. L. Shearer.—p. 168.
Treatment with Thyroid Extract. H. H. Zinneman.—p. 170.
Intracranial Aneurysms: Clinico-Pathologic Correlation. F. H. Tanner and R. C. Hasty.—p. 172.
Infectious Diarrheas: Part III. Some Bacteriological and Epidemiological Aspects. H. W. McFadden Jr. and M. F. Gunderson.—p. 176.

New England Journal of Medicine, Boston

244:577-614 (April 19) 1951

*Rice Diet in Ambulatory Patients with Essential Hypertension: Two-Year Study of 105 Patients. D. G. Loofbourow, D. Callahan and R. S. Palmer.—p. 577.
*Untoward Reactions to Tests for Epinephrine-Secreting Tumors (Pheochromocytoma). H. R. Bierman and J. W. Partridge.—p. 582.
Stellate Block as Adjunct to Treatment of Pulmonary Embolism. H. H. Faxon, J. H. Flynn and R. M. Anderson.—p. 586.
Reversible Uremia with Hypercalcemia Due to Vitamin-D Intoxication. F. D. Adams.—p. 590.
Medicine as Social Instrument: Military Medicine. T. F. Whayne and J. H. McNinch.—p. 592.

Rice Diet in Hypertension.—The effect of the rice diet in two groups of outpatients with essential hypertension is evaluated. The first group (56 patients) was started on the diet in 1947, the second group (41 patients) in 1948. Of the total 97 patients, 28 adhered strictly, 35 moderately, and 34 not at all. In two years' time, which must be considered a brief and preliminary follow-up in essential hypertension, two of the strict adherents had maintained improvement in blood pressure by Kempner's criterion, a reduction of 20 mm. of mercury in mean arterial pressure. Three of the group had died; in nine, the disease had progressed, and in four had seemingly remained stationary. In a random group of patients treated on a conservative medical program, the authors could easily match these results, unless the group were weighted with cases of malignant hypertension. They believe that the rice diet is unpleasant and expensive for the patient because of weekly visits to the physician, demanding on the physician, and potentially dangerous. Nevertheless, the rice diet in some patients with severe hypertension apparently causes dramatic reversal of the disease process. It seems that to justify so rigorous a treatment it must be matched by the actual or impending rigors of the disease.

Untoward Reactions to Tests for Pheochromocytoma.—Fifty-six separate pharmacologic tests with adrenolytic substances were done on 18 hypertensive and three normotensive patients suspected of having pheochromocytoma. The test substances were injected intravenously. The injection time for piperoxan hydrochloride (933 F) and tetraethylammonium bromide was two minutes. The N,N-dibenzyl-beta-chlorethylamine (dibenamine®) was added directly to 500 cc. of isotonic sodium chloride solution and infused over a two-hour period. Tests were made under resting but not basal conditions. Frequent blood pressure readings were taken prior, during, and after the injection of the test substance. Untoward severe but nonfatal reactions were observed in four patients. In the first patient a rise in blood pressure exceeded 300 mm. of mercury immediately after the administration of 3 and 5 mg. of 933 F. The second patient received 17 mg. of 933 F, and acute pulmonary edema promptly developed. The third patient had anuria for 14 hr. after receiving dibenamine®. The fourth patient had a pronounced hypotensive reaction after receiving tetraethylammonium bromide. The relatively high incidence of toxic reactions in this series was probably due to the type of patients studied. Pharmacologic tests for pheochromocytoma with adrenolytic substances are not without danger, and they must be used with caution.

244:615-656 (April 26) 1951

Metabolic Effects of Anesthesia in Man: IV. Comparison of Effects of Certain Anesthetic Agents on Normal Liver. C. W. Fairlie, T. P. Barss, A. B. French and others.—p. 615.
*Treatment of Subacute Bacterial Endocarditis with Aureomycin and Chloromycetin. L. W. Kane and J. J. Finn Jr.—p. 623.
*Comparative Study of Pregnenolone, 21-Acetoxypregnenolone and ACTH. H. G. Brugsch and R. A. Manning.—p. 628.
Multiple Hypernephromas of Kidney in Association with Lindau's Disease. L. F. Greene and M. H. Rosenthal.—p. 633.
Medicine as Social Instrument: Industrial Medicine. I. R. Tabershaw.—p. 634.

Treatment of Endocarditis.—Antibiotic treatment was given to 11 patients with subacute bacterial endocarditis. All patients were treated with aureomycin or chloramphenicol (chloromycetin®), either initially or after other antibiotics had failed to control the infection. The dose depended on the sensitivity in vitro of the infecting organism. The average dose of aureomycin was 0.5 to 1 gm., and of chloramphenicol 1 gm., both given orally every six hours. In two patients who could not tolerate the oral route aureomycin was administered intravenously. In three patients, treatment with chloramphenicol was initiated with a priming dose of 1 gm. every hour for four doses. The duration of treatment, which varied with each patient, was from eight to 35 days. In two of eight patients treated with aureomycin, the infection was considered to have been controlled by this drug. In both patients the blood cultures became negative on the day following institution of therapy. The infecting organisms in both patients were very sensitive strains of Streptococcus viridans. In these two patients the follow-up period was 11 and 12 mo. and there was no relapse. Aureomycin failed in the remaining six patients, in three of whom Str. faecalis was the infecting organism. Two of these patients were subsequently cured by large doses of penicillin. Chloramphenicol was used in five patients. A definite cure was effected in only one patient. Blood cultures became negative within 24 hr. after institution of therapy, which lasted 35 days. This patient was followed for five months after discontinuation of the drug, and there was no evidence of relapse. All patients treated with aureomycin had gastrointestinal symptoms, including anorexia, nausea, vomiting, or diarrhea. In general, chloramphenicol was more readily tolerated than aureomycin. Only one patient complained of nausea, and in two a mild maculopapular rash developed. Aureomycin and chloramphenicol may effect a bacteriologic cure in certain cases of subacute bacterial endocarditis due to a sensitive organism. An organism found to be sensitive to aureomycin and chloramphenicol in vitro will not necessarily respond in vivo. In the small series of patients reported on, aureomycin and chloromycetin were not effective when penicillin had previously failed, but penicillin was effective when these antibiotics did not control the infection. Patients had better symptomatic results with penicillin. Results indicate that penicillin is the antibiotic of choice in the therapy of subacute bacterial endocarditis due to Str. viridans and Str. faecalis. If large doses of penicillin or the combination of penicillin and streptomycin prove ineffective, aureomycin or chloramphenicol should be tried if in vitro studies are favorable.

Pregnenolone in Rheumatoid Arthritis.—Twenty patients with rheumatoid arthritis and one with polyarticular gout were treated as follows: Fifteen received daily intramuscular injections of an oily or aqueous suspension of the steroid pregnenolone in doses ranging from 100 to 600 mg. Two patients received two daily injections up to a total of 1,200 mg. per day. The injections were continued for four to eight weeks. Six patients were given 21-acetoxypregnenolone in daily intramuscular injections of an aqueous suspension in doses ranging from 100 to 300 mg. for two to four weeks. In addition, a course of corticotrophin (ACTH) was given to nine patients in doses of 15 mg. subcutaneously every eight hours for two to three weeks. Only one patient treated with pregnenolone felt much better at the end of the two months of treatment. In all other patients, the injections of pregnenolone and 21-acetoxypregnenolone did not produce any noticeable improvement of joint function, gain of weight, or return of the sedimentation rate to normal or even noticeably lower values. The various blood constituents examined, such as hemoglobin and white blood cells, also remained unchanged. Rheumatic nodules did not disappear, although one patient showed decrease in number and size of nodes under treatment with pregnenolone. All nine patients treated with coricotrophin after previous treatment with pregnenolone or 21-acetoxypregnenolone made a rapid clinical recovery. Neither pregnenolone nor 21-acetoxypregnenolone produced a sustained beneficial effect comparable to that obtained with corticotrophin. Side effects observed in the use of pregnenolone or 21-acetoxypregnenolone were rare and usually were only painful sensations at the site of injections. Repeated injections caused formation of firm lumps sometimes lasting several months. Prolonged menstrual flow occurred in two patients. Pregnenolone and 21-acetoxypregnenolone do not represent lastingly effective and innocuous drugs for the treatment of severe active rheumatoid arthritis.

New Orleans Medical and Surgical Journal

103:411-454 (April) 1951

*Fallacies in Current Therapeutic Trends in Acute Appendicitis. F. F. Boyce.—*p.* 411.
Symposium on Cancer: Principles of Surgical Treatment of Cancer. P. T. DeCamp.—*p.* 416.
Hormones in Cancer Therapy. A. Segaloff.—p. 419.
Treatment of Carcinoma of Cervix at Charity Hospital: III. Cumulative Results at Three, Five and 10 Years in 1,641 Cases. M. Garcia.—p. 421.
Incidence of Carcinoma of Cervix in Jewish Women. M. Sugar and W. E. Levy.—p. 424.
Role of Hormones in Maintenance of Pregnancy. J. W. Hendrick. —p. 426.

Fallacies in Acute Appendicitis.—A study of acute appendicitis was begun at New Orleans Charity Hospital in 1933, and 7,613 cases were analyzed in seven series. The total mortality rate was 4.46%, but it has declined successively from 6.58 to 1.7%. Despite this decline, the incidence of complications is increasing. This may be partly explained by the fact that many patients entered the hospital after the first 24 hr. of illness and that more than a third had taken purgatives, sometimes on the advice of physicians. Enemas were also ordered by physicians, and icebags are again being used. Apparently, many physicians are not aware that appendicitis is often an atypical disease. The physician should not wait 12 hr. to "re-evaluate" a patient; operation should be performed at the end of six hours if acute appendicitis cannot be ruled out. That the mortality rate has declined despite the aforementioned deplorable tendencies is largely due to intensive supportive therapy and to chemotherapy. The limitation of chemotherapy is stressed: many delays in surgical treatment must be attributed to its unjudicious use. The author favors prompt operation, because: 1. The diagnosis of rupture of the appendix is inaccurate. 2. It is impossible to determine whether peritonitis is spreading or is localizing. 3. A localized abscess may rupture intraperitoneally and cause death. 4. A properly performed surgical procedure that removes the source of infection is safer than continued entrance into the peritoneal cavity of infection from a ruptured viscus. 5. The results of conservative therapy are no better than the results of prompt surgery. While the curative properties of the antibiotics should be utilized, it should be remembered that they are ineffective in areas of inadequate circulation, such as in gangrenous processes and walled-off abscesses. In uncomplicated cases of acute appendicitis these agents are adjuncts to, not substitutes for, surgical procedures.

New York State Journal of Medicine, New York

51:817-976 (April 1) 1951

Modern Trends in Colon Surgery. F. D. Conole.—p. 934.
Intravaginal Penicillin Therapy. R. I. Walter, M. A. Goldberger and L. S. Lapid.—p. 937.
Phantom Tumors of Pelvis and Case Report. W. S. Goldfarb.—p. 939.
Medical Problems in Chemical Warfare. M. D. Kogel.—p. 942.

51:977-1104 (April 15) 1951

*Evaluation of Steroids in Rheumatoid Arthritis. B. M. Norcross, L. M. Lockie and J. H. Talbott.—p. 1031.
Clinical Evaluation of Priscoline as Peripheral Vasodilator. H. B. Zurrow, P. H. Henried, I. Fischer and G. Saland.—p. 1038.
Coarctation of Aorta. F. Glenn and W. D. O'Sullivan.—p. 1041.
Silicosis Among Iron Foundry Workers. S. Solomon.—p. 1045.
Simple Technic for Suprascapular Nerve Block. L. W. Granirer.—p. 1048.
Carcinoma of Extrahepatic Bile Ducts Exclusive of Papilla of Vater. G. M. Saypol.—p. 1049.
*Comparative Study of Oral Terramycin and Aureomycin Therapy of Gonorrhea in Males. M. S. Beinfield, L. T. Wright, F. R. DeLuca and others.—p. 1054.

Steroids in Rheumatoid Arthritis.—Of the 67 patients who received a total of 109 therapeutic courses with steroids, 55 had typical peripheral rheumatoid arthritis, seven had rheumatoid spondylitis, four had rheumatoid arthritis associated with psoriasis, and one had advanced osteoarthritis. The steroids were estosterone, desoxycorticosterone acetate combined with ascorbic acid, 21-acetoxypregnenolone, pregnenolone, 16-dehydro-pregnenolone, and cortisone. Thirty-four patients received only one course of treatment; the other 33 received more courses. Improvement occurred in some patients with each steroid, but in no group was the response comparable to that obtained with cortisone. Twenty-two of the 24 patients who received cortisone had previously failed to respond satisfactorily to the other steroids. No severe toxic symptoms resulted from cortisone therapy in this group.

Oral Terramycin and Aureomycin for Gonorrhea in Males.—Terramycin or aureomycin was orally administered to 260 unselected male patients in whom gonococcic urethritis had been proved by smear and culture. Three different dosage schedules were used. The first consisted of a total dose of 2 gm. given in four divided doses of 0.5 gm. at four-hour intervals. In the second, 500 mg. were given initially at about 10 a. m., a 250 mg. capsule was given at 2 p. m., and another 250 mg. capsule at 6 p. m. of the same day. In the third schedule a total dose of 1 gm. was given in divided doses of 0.5 gm. at six-hour intervals. An equal number (130) of the patients were treated with each of the drugs. The percentage of cure with both terramycin and aureomycin was between 95 and 96%, or as high as that obtained with intramuscular injections of penicillin. Effectiveness, lack of toxicity, and ease of administration make orally administered terramycin and aureomycin the agents of choice in this condition.

North Carolina Medical Journal, Winston-Salem

12:129-168 (April) 1951

Convulsive Disorders in Children: Study of Duke Hospital Pediatric Convulsive Clinic. I. Pine, D. H. Reynolds and H. B. O'Rear.—p. 129.
Diagnosis and Management of Colonic and Rectal Polyps. I. E. Harris Jr. and J. B. Littlefield.—p. 138.
Mesenteric Cysts. W. H. Freeman.—p. 143.
Horseshoe Kidney. C. M. Norfleet Jr. and T. B. Daniel.—p. 147.
Infantile Meningitis Due to Unusual Aerobic Spore-Forming Bacillus: Case Report. D. P. Boyette, F. L. Rights and W. E. Keiter.—p. 150.
Progressive Lipodystrophy: Report of Two Cases. M. L. Williams and W. M. Kelsey.—p. 152.
Pleuropericardial Cyst: Report of Case. W. B. McCutcheon, R. D. Baxley and J. J. McDonald.—p. 154.

Pennsylvania Medical Journal, Harrisburg

54:401-512 (May) 1951

Keeping Abreast of Medical Progress. W. M. Yater,—p. 425.
Recent Trends in Treatment of Goiter. H. L. Foss and A. F. Cooper. —p. 430.
Acute Appendicitis and Its Complications. J. E. Rhoads and R. P. Darrow.—p. 435.
Diagnosis and Initial Treatment of Diabetic Emergencies. G. G. Duncan and B. Beidleman.—p. 440.
Orthopedic Management of Arthritis. P. C. Colonna.—p. 443.
Organic Heart Disease and Pregnancy. C. A. Laubach Jr. and W. J. Stainsby.—p. 445.

Plastic and Reconstructive Surgery, Baltimore

7:263-342 (April) 1951

*Corneal Tattoo for Restoration of Eye Color. K. L. Pickrell, B. F. Edwards, T. R. Broadbent and others.—p. 263.
Use of Autogenous Cartilage Graft in Arthroplasty for True Ankylosis of Temporo-Mandibular Joint. J. J. Longacre and R. F. Gilby.—p. 271.
Mammaplastic Procedure. J. A. Tamerin.—p. 288.
Mammaryplasty and Its Complications with Special Reference to Nipple Loss and Its Replacement. H. B. Thale.—p. 296.
Cavernous Hemangiomas Which Failed to Respond to Various Forms of Treatment Other Than Surgery. B. S. Jeremiah.—p. 302.
Reconstruction of Cicatricial Nasal Retraction After Leishmaniasis. A. D. Cardoso.—p. 309.
Repair of Massive Defects by Use of Local Sliding Flaps: Report of Two Cases. A. W. von Deilen.—p. 316.
Congenital Bilateral Ear Atresia: Correction with Plastic Surgery and Prostheses. A. M. Brown.—p. 327.

Corneal Tattoo for Restoration of Eye Color.—Some persons with corneal scars who have reduced sight or no serviceable vision and who are not acceptable for a corneal graft cannot tolerate a prosthetic shell because the calcareous deposits projecting from the scar rub against the prosthesis and cause pain and uncontrollable lacrimation. In the business and social world, the person with an unsightly "poached-egg-eye" may be seriously handicapped and may consequently have psychic disturbances. Even though an eye may be blind, tattoo of a corneal scar will conceal a conspicuous and embarrassing deformity. In a series of experiments on rabbits Pickrell and collaborators had tattooed both scarred and normal corneas. They describe the procedure and show photographs of human subjects showing the results of the implantation of pigment to match the normal eye. The method has been used more than 75 times during the past six years, without complication. Patients with congenital opaque cornea, post-traumatic corneal scars, conjunctival flaps, operative defects of the iris, heterochromia, polychromia, and coloboma have been tattooed with gratifying results.

Proc. Soc. Exper. Biol. & Med., Utica, N. Y.

76:413-618 (March) 1951. **Partial Index**

Effect of Administration of ACTH and Cortisone upon Blood Glutathione Levels. W. C. Hess, L. H. Kyle and P. D. Doolan.—p. 418.
Effect of Nitrogen Mustard on Serum Complement in Vitro and in Patients with Neoplastic Disease. C. M. Southam and Y. Goldsmith. —p. 430.
Relation of Clearance and Distribution of Injected Glutathione to Protection Against Radiation Injury. E. P. Cronkite, W. H. Chapman and G. Brecher.—p. 456.
New Dialyzer for Use as Artificial Kidney. S. S. Rosenak and A. Saltzman.—p. 471.
Pneumoperitoneum in Preoperative Preparation for Total Gastrectomy. B. Maisel.—p. 484.
*Diasone and Promin as Therapeutic Agents in Experimental Toxoplasmosis. J. B. Cross.—p. 548.
Beneficial Effects of Vitamin B_{12} and Folic Acid on Recovery from Internal Radiation by P^{32}. W. E. Cornatzer, C. Artom, G. T. Harrell Jr. and D. Cayer.—p. 552.
Development and Secretion of Blood Group Factor O in the Newborn. T. G. Formaggio.—p. 554.
Failure of ACTH to Protect Against Acutely Lethal Toxins of Influenza Virus and Rickettsiae. E. H. Kass, F. A. Neva and M. Finland. —p. 560.
*Development of Thyroid Neoplasms in Rat Following Single Injection of Radioactive Iodine. R. C. Goldberg and I. L. Chaikoff.—p. 563.
Cortisone and Blood Pressure. G. A. Perera.—p. 583.
*Ability of Infants to Taste PTC: Its Application in Cases of Doubtful Paternity. H. M. Cardullo and L. E. Holt Jr.—p. 589.

Sulfoxone and Glucosulfone in Toxoplasmosis.—On the assumption that toxoplasmosis is essentially a disease of the reticuloendothelial system a therapeutic trial with sulfoxone (diasone®) sodium and with glucosulfone (promin®) sodium seemed justified, because these sulfones had proved beneficial in leprosy, also a reticuloendothelial disease. Sulfoxone was given subcutaneously, and glucosulfone (0.5%) was put in the food. Both drugs not only suppressed the symptoms but repeatedly eliminated the carrier state. Mice treated with glucosulfone survived over a year, but sulfoxone appears to be less toxic and more potent, since it protected mice when therapy was delayed for one-third of the survival time of untreated mice.

Neoplasms in Thyroid After Injection of Radioactive Iodine.—Examination of 10 rats killed 18 mo. after a single injection of 400 µc of radioactive iodine revealed the following changes in the thyroid gland: 1. Hürthle-like elements (previously observed in thyroid of rats killed eight months after a single injection of I^{131}) were evident in the parenchyma of all glands. 2. Multiple adenomas, apparently benign, were found in the thyroids of two rats. 3. Two types of anaplastic, nonencapsulated neoplasms, one of which was invading adjacent thyroid tissue, were also found in the thyroids of these two rats. The possibility that the trapped I^{131} might initiate neoplastic changes in the thyroid gland has been recognized by many clinical investigators, who have mentioned the need for caution in the use of radioiodine for diagnosis and treatment of Graves' disease.

Phenylthiocarbamide Test in Doubtful Paternity.—Phenylthiocarbamide is known to divide the adult population into two groups, those capable of tasting its intense bitterness (T) and those to whom it is tasteless (t). The capacity for tasting or failing to taste the compound is inherited according to Mendelian laws. It is demonstrated that the ability to taste this compound is demonstrable in early infancy, and it is suggested that such data can be profitably employed in cases of doubtful paternity in situations where a tasting child is born to a nontasting mother.

Psychoanalytic Review, Albany, N. Y.

38:103-204 (April) 1951. **Partial Index**

Some Aspects of Theory and Treatment of Schizophrenia. Z. A. Aarons —p. 113.
Depressive, Aggressive and Paranoid Reactions. B. A. Kamm.—p. 127.
Psychoanalytic Study of Case of Murder. B. Karpman.—p. 139.

Psychosomatic Medicine, New York

13:71-132 (March-April) 1951

Life Situations, Emotions, and Nasal Disease: Evidence on Summative Effects Exhibited in Patients with "Hay Fever." T. H. Holmes, T. Treuting and H. G. Wolff.—p. 71.
Evaluation of Psychotherapy: With Follow-Up Study of 62 Cases of Anxiety Neurosis. H. H. W. Miles, E. L. Barrabee and J. E. Finesinger. —p. 83.
Effects of Stress and Results of Medication in Different Personalities with Parkinson's Disease. J. S. Prichard, R. S. Schwab and W. A. Tillmann.—p. 106.
Physiologic and Psychodynamic Mechanisms in Constipation and Diarrhea. T. S. Szasz.—p. 112.
Personality Patterns in Patients with Malignant Tumors of Breast and Cervix: Exploratory Study. M. Tarlau and I. Smalheiser.—p. 117.

South Carolina Medical Assn. Journal, Florence

47:121-156 (April) 1951

Treatment of Fibromyomas of Uterus. J. R. Young and J. H. Young. —p. 121.
*Lateral Herniations of Cervical Discs. C. J. Lemmon Jr.—p. 122.
Gastroileostomy. J. Zeliff and G. B. Hodge.—p. 126.
Superficial Fungus Infections. K. A. Riley.—p. 127.
*Murine Typhus Fever: Its Incidence and Control in South Carolina. J. C. Hedden.—p. 129.
Breast Carcinoma: Statistical Analysis. C. B. Hanna and R. W. Postlethwait.—p. 133.

Lateral Herniations of Cervical Disks.—The syndrome caused by lateral herniation of cervical disks is constant, and the specific nerve root involved can usually be identified clinically. These patients often have symptoms of severe shoulder and arm pain. They may also have neck, occipital, and chest pain on the involved side. Stiffness or a "crick" in the neck may be or have been present. Often the physician's attention is directed entirely to the shoulder and upper extremity. Sometimes the pain extends into the hand, but more commonly numbness and paresthesias are present in the hand. The vast majority of cases are amenable to conservative medical therapy. In cases not amenable to medical therapy, the diagnosis and the specific nerve root involved can be verified by pantopaque myelography and relief obtained by surgical removal of the herniated cervical disk. Two cases are presented that illustrate some of the variations and problems encountered in this condition.

Murine Typhus Fever.—After commenting on the epidemiology of old world typhus and murine typhus Hedden discusses the present status of the problem of murine typhus in South Carolina. He stresses that this is still predominately a disease of cities and towns in South Carolina. The highest incidence of typhus in South Carolina is in the eastern half of the state. Trucks carrying rats as well as grains and produce have undoubtedly played a part in carrying typhus to out-of-the-way communities. Annual reports of the South Carolina State Board of Health beginning with the year 1937 reveal concern over the increase in incidence of typhus fever. In 1939, a total of 232 cases was reported from the entire state. In July, 1942, the significant increase in incidence of typhus fever and the war effort caused the United States Public Health Service to form a typhus control unit. In 1945, typhus control activities were reorganized. Morbidity statistics for typhus fever in South Carolina were considered to warrant federal assistance. Typhus control measures, such as rat poisoning, dichlorodiphenyltrichloroethane (DDT) dusting, and rat-proofing appear to be reducing the incidence of the disease in South Carolina.

Surgery, Gynecology and Obstetrics, Chicago

92:513-640 (May) 1951

Replacement of Femoral Head by Prosthesis for Reconstruction of Hip Joint: Report on the Judet Method. W. R. MacAusland.—p. 513.
Carcinoma of Rectum: Prognosis Based on Distance of Lesions from, or Involvement of, Levator Ani Muscle, and Involvement of Anal Sphincters. D. E. Guernsey, J. M. Waugh and M. B. Dockerty.—p. 529.
Splenectomy for Purpura Hemorrhagica. R. H. E. Elliott Jr. and J. C. Turner.—p. 539.
Colloid Cyst of Third Ventricle. H. Cairns and W. H. Mosberg Jr. —p. 545.
Reconstruction of Common Bile Duct with Free Ureteral Graft: Experimental Study. C. E. Sedgwick.—p. 571.
Pigmented Villonodular Synovitis: Report of Seven Cases. S. J. Shafer and W. A. Larmon.—p. 574.
Fate of Arterial Grafts in Small Arteries: Experimental Study. H. H. Miller, A. D. Callow, C. S. Welch and H. E. MacMahon.—p. 581.
Studies of Nitrogen Metabolism in Surgical Patients with Parenteral Administration of Concentrated Human Albumin and Red Blood Cells. D. State, D. J. Ferguson and I. Baronofsky.—p. 589.
Liver Function Studies in Normal and Toxemic Pregnancy. W. J. Dieckmann, R. C. Smitter and R. E. Pottinger.—p. 598.

SYMPOSIUM: PSYCHIATRIC EVALUATION OF PSYCHOSURGERY

Principles Governing Selection of Cases for Psychosurgery. L. B. Kalinowsky.—p. 601.
*Lobotomy: Comparison of Prefrontal Lobotomy with Transorbital Lobotomy. W. Freeman.—p. 603.
Psychiatric Evaluation of Results Following Unilateral Prefrontal Lobotomy Under Direct Vision. H. C. Solomon.—p. 606.
*Evaluations of Results of Topectomy Operations. P. H. Hoch.—p. 609.
Selective Cortical Undercutting: Results in New Method of Fractional Lobotomy. E. K. Wilk.—p. 611.
Evaluation of Results of Thalamotomy and Other Surgical Procedures for Relief of Psychoses. E. A. Spiegel and H. Freed.—p. 615.

Prefrontal Lobotomy Compared with Transorbital Lobotomy.—Freeman compares the results of prefrontal lobotomy in 624 patients (702 operations) with those of transorbital lobotomy in 316 patients. Lobotomy fails mostly because, in deteriorated patients, it is impossible to place the lesions sufficiently far back to relieve the psychosis without at the same time damaging those personality characteristics that are necessary for living in a social environment. Patients with dementia precox are somewhat less likely to respond to prefrontal lobotomy with effective social capacity than those suffering from affective disorders like involutional depressions or from various types of psychoneuroses. Nevertheless, more than one out of four patients with dementia precox is leading a socially useful existence after the operation. About 75% of the 624 patients have benefited. The failures are mostly in those patients in whom deterioration before operation was too great to allow much hope of successful adjustment. Prefrontal lobotomy is a major surgical operation and is usually performed by the neurosurgeon. In 1946, after much study of the anatomic relationships, Freeman began to use the transorbital approach, the technique of which is quite simple. Recovery from transorbital lobotomy is prompt. Hospitalization lasts only a day or two and the swelling and discoloration of the eyelids disappear within two weeks. Disabled patients are back at their accustomed tasks by the end of a month. The mortality rate following transorbital lobotomy is less than 2%. The over-all results are about the same for the two types of operation, 68% of patients being able to live outside of institutions after transorbital lobotomy as compared with 70% after prefrontal lobotomy. The minor operation is less successful in dementia precox cases but more successful in the other types of mental disorder. Transorbital lobotomy is the method of choice in institutional practice.

Results of Topectomy.—Topectomy is a fractional ablation of the frontal lobe cortex, with resection in only the gray matter. The amount of tissue removed is usually between 25 and 35 gm. on each side. Hoch describes psychiatric observations made on 105 patients who had been subjected to topectomy by Dr. Pool and his staff. Most of the patients subjected to topectomy had schizophrenia of the hebephrenic, catatonic, paranoid, mixed, or simple forms. One-fifth (21) of the patients had a pseudo-psychoneurotic form of schizophrenia. All patients operated on had been sick for several years and had received shock treatment, psychotherapy, or both. Sixty per cent of the patients remained unimproved. Thirty (29%) were sufficiently improved to be provisionally released. Nearly two-thirds of those who had no preoperative deterioration showed good improvement, whereas among the greatly deteriorated patients only 7% showed improvement. Topectomy was effective in those with obsessive and phobic symptomatology. It is believed that topectomy would give better results if it could be done on schizophrenic patients in whom other treatments have failed but who have not yet greatly deteriorated. Obsessive, depressive, and phobic symptoms seem to respond best to topectomy, whereas aggressive patients seemingly respond better to lobotomy than to topectomy. The clinical impression is that pronounced alterations in personality, especially the well-known apathy, complacency, and emotional dulling, do not occur as frequently with topectomy as with lobotomy. Adverse personality changes after topectomy are seen more commonly in deteriorated schizophrenic patients than in those with a relatively well preserved mentality prior to the operation.

U. S. Armed Forces Med. J., Washington, D. C.

2:541-706 (April) 1951. **Partial Index**

Group Panic and Other Mass Disruptive Reactions. J. M. Caldwell, S. W. Ranson and J. G. Sacks.—p. 541.
Modern Burn Therapy. S. H. Tolins.—p. 569.
Survival After Almost Complete Body Surface Burn: Relation to Newer Concepts of Treatment and Report of Case. I. L. Hoffman and A. W. Bronwell.—p. 577.
Medical Aspects of Management of Mass Casualties. H. L. Jones Jr. —p. 593.
Use of Excretory Urograms as Screening Procedure. T. H. Williams Jr. —p. 603.
*Prevention of Rheumatic Fever. C. H. Rammelkamp and others.—p. 607.
Hemorrhagic Manifestations of Sickle Cell Disease. J. E. Ryan and R. H. Fuller.—p. 623.
Lipoma of Colon: Case Report. M. L. Smith and L. D. Heaton.—p. 635.
Ruptured Duodenal Ulcer Coincident with Gastric Carcinoma. D. E. Reiner, L. A. Smith and R. B. Cohn.—p. 643.
Use of Tantalum Screen in Repair of Nasal Deformities. L. E. Wible, A. Trombetta and G. E. Wineinger.—p. 653.
Calcification of Pericardium. J. H. Forsee, H. W. Swan II, E. M. Goyette and H. P. Makel.—p. .663.
Correction of Malocclusion After Unreduced Fractures. B. W. Oesterling and W. B. Johnson.—p. 667.
Wolff-Parkinson-White Syndrome: Report of Two Cases. J. J. Robbins. —p. 671.
Some Unusual Tumors Encountered. E. H. Carnes.—p. 679.
About the Army Medical Service: The Physician in the Present Emergency. P. I. Robinson.—p. 691.

Prevention of Rheumatic Fever.—All patients admitted to the hospital of an air base for respiratory disease were examined for the presence of exudate on the tonsils or on the pharyngeal wall. Of 2,340 such patients about half received penicillin treatment and the others comprised the control group and received no specific treatment. Of the patients treated with penicillin, definite acute rheumatic fever developed in only two. In contrast, the disease developed in 28 of the untreated patients. The diagnosis of possible acute rheumatic fever was made in three patients in the treated group and in seven patients in the untreated group. Penicillin also suppresses the antistreptolysin "O" response and eradicates the streptococci in many cases. These data seem to establish the fact that penicillin therapy for acute streptococcic infections will almost always prevent the subsequent occurrence of rheumatic fever. Recommendations are made for the prevention of rheumatic fever in streptococcic infections.

FOREIGN

Acta Cardiologica, Brussels

6:101-218 (No. 2) 1951. Partial Index

*Myocardial Injury at Cardiac Catheterization: Report of Case. G. Biorck and H. Krook.—p. 101.
First Clinical Results of Recordings of Auricular and Ventricular Blood Pressure. L. Condorelli, A. Turchetti, G. Schirosa and A. Strano.—p. 107.
Electrocardiographic Diagnosis of Ventricular Hypertrophy in Bundle Branch Block. J. Laham, O. Gialloreti and J. Lenegre.—p. 129.
Electrokymographic Study of Delay of Ejection in Intraventricular Blocks. M. Segers and J. Hendrickx.—p. 150.

Myocardial Injury at Cardiac Catheterization.—The patient whose case is reported was a boy, 8, who was referred for diagnosis of a suspected congenital heart malformation. A harsh systolic murmur was heard and felt in the left second costal interspace. The electrocardiogram showed a right axis deviation, but the heart was roentgenologically within normal limits. There was some increase in pulmonary vascularization. Carotid aortography showed a patent ductus arteriosus. Cardiac catheterization suggested that there was a shunt between aorta and the pulmonary artery, probably a patent ductus arteriosus, and a pulmonary stenosis. During the catheterization, which was performed without difficulty, the electrocardiogram showed instability of the pacemaker, not only with variations in the P-Q interval and the P-wave itself but also with changes in the QRS-complexes, which simulated preexcitation but probably represented nodal rhythm with or without additional intraventricular, or septal, conduction disturbances. Concurrently, but in all likelihood independently of these conduction disturbances, the electrocardiogram also revealed marked S-T depressions, which may be considered as representing subendocardial injury. Intracavitary pressure readings taken simultaneously showed pronounced reduction of right ventricular systolic pressures. Although this was probably partly due to unknown mechanical factors relating to the position of the catheter tip, the authors felt it was more likely due to functional myocardial insufficiency, related to and perhaps induced by the simultaneous subendocardial injury. That cardiac catheterization may initiate lesions of the endocardial surfaces was recently proved in dogs. The authors feel that in more irritable hearts than this boy's such myocardial injury may constitute a grave danger.

Annals of Rheumatic Diseases, London

10:1-104 (March) 1951

Practical Considerations of Use of Cortisone and ACTH in Rheumatoid Arthritis. R. H. Freyberg, M. Patterson, C. H. Adams and others.—p. 1.
Muscle, Nerve, and Synovial Changes in Lupus Erythematosus. E. W. Lowman.—p. 16.
*Nylon Arthroplasty in Rheumatoid and Osteo-Arthritis. J. G. Kuhns and T. A. Potter.—p. 22.
Pregnenolone in Treatment of Rheumatoid Arthritis. G. N. Myers.—p. 32.
Plasma and Serum Proteins in Chronic Rheumatic Diseases. H. B. Salt.—p. 46.
*Pregnancy in Ankylosing Spondylitis: Report of Two Cases. F. D. Hart, A. C. H. Bell and G. S. W. Organe.—p. 54.
Spondylitis Following Weil's Disease. J. H. Jacobs.—p. 61.
Thermal Response in Rheumatoid Arthritis. A. Woodmansey.—p. 65.

Nylon Arthroplasty in Arthritis.—In chronic rheumatoid arthritis, disability of the knee usually begins with flexion deformity and progresses to subluxation, destruction of the articular surfaces, or ankylosis of the joint. While ankylosis in full extension does not greatly interfere with walking or standing, it seriously disturbs rising and sitting. Attempts have been made to produce motion in the knee joint by either resection or reshaping of the articular surfaces and the interposition of fascia lata. In seeking a more durable substance for interposition between the articular surfaces, the authors found that most plastic films caused slight irritation when inserted into the rectus sheath of rats but that there was no irritation with the nylon membrane. Small pieces of nylon were then attached to the denuded undersurface of the patella in rabbits. No inflammation was observed in the joint and the animals seemed to use the knee in a normal manner. By modifying a procedure described by Hass in 1930 the authors then developed a simple method of forming new knee joints, employing nylon films to prevent adhesions of the joint surfaces. They performed this operation in 33 patients. In the group with bony ankylosis all except two obtained a satisfactory range of painless motion. Those with severe osteoarthritis of the knee now have a wide range of painless motion, and the authors believe that the operation will have a wider application in severe osteoarthritis. To date they have observed no reaction to the nylon membrane. A firm layer of fibrous tissue develops under the nylon. Early active motion is essential to the success of this procedure, and careful postoperative observation is required if complications are to be prevented.

Pregnancy in Ankylosing Spondylitis.—Hart and associates describe and discuss the management of pregnancy in two patients with ankylosing spondylitis. One woman, with a mild form, had an easy labor, but her disease appeared to progress during cyesis. The other, with severe ankylosis, was delivered of a normal child by cesarean section in the 36th week. Her vital capacity rose slightly during pregnancy, and, although her thorax was completely fused, no respiratory distress was experienced. In neither case was there symptomatic improvement or true remission during pregnancy.

Brain, London

73:431-552 (Dec.) 1950

Blood Pyruvate Estimations in Diagnosis and Treatment of Polyneuritis. C. L. Joiner, B. McArdle and R. H. S. Thompson.—p. 431.
*Fits of Laughter (Sham Mirth) in Organic Cerebral Disease. J. P. Martin.—p. 453.
Cerebral Basis of Consciousness. W. R. Brain.—p. 465.
Comparison of Sensory Dissociation Produced by Procaine and by Limb Compression. D. C. Sinclair and J. R. Hinshaw.—p. 480.
Symptomatic "Cataplexy" or Chalastic Fits in Cortical Lesion of Frontal Lobe. S. Ethelberg.—p. 499.
Further Studies on Role of Proprioception in Cortically Induced Movements of Foreleg in Monkey. E. Gellhorn and D. A. Johnson.—p. 513.
Study of Retrograde Degeneration in Oculomotor Nucleus of Rhesus Monkey, with Note on Method of Recording Its Distribution. R. Warwick.—p. 532.

Laughter (Sham Mirth) in Cerebral Disease.—Four cases are described in which attacks of laughter occurred in association with organic cerebral disease, and similar cases from the literature are quoted. The episodes of laughter are considered to be fits comparable with Jacksonian (motor or sensory) fits. The patient's emotional state at the time of such an attack is not that appropriate to laughter—the apparent mirth is "sham." In every case in which there were indications of the site of the lesion, it was so placed that it might affect the hypothalamus, and these cases give support to the view that the motor center for laughter is situated in or near the hypothalamus. There was no indication that the attacks depended on any gradual loss of control, such as occurs with cerebral arteriosclerosis, pseudobulbar palsy, or amyotrophic lateral sclerosis. All the four patients were young (18 to 25 yr.), whereas in cases of uncontrolled laughter due to removal of inhibitory control the patients are mostly middle-aged or elderly. Another feature of these cases was their sinister character. In the first case the attacks of laughter were soon followed by death, in the second by a severe hemiplegia, in the third further subarachnoid hemorrhage threatened, in Andersen's case the laughing led immediately to coma and death, and in the fourth case, reported here, it led to coma and slow death. It seems that the "laughing center" must lie close to vital structures.

British Journal of Experimental Pathology, London

32:1-50 (Feb.) 1951. Partial Index

Coproporphyrin III Isolated from Human Tubercle Bacillus by Chromatographic and Fluorescence Analysis: Fluorescence and Absorption Spectral Data. M. O'L. Crowe and A. Walker.—p. 1.
Nucleic Acid Metabolism in Virus Infections. D. J. Bauer.—p. 7.
Experimental Study of Senecio Poisoning in Rats. G. Selzer, R. G. F. Parker and N. Sapeika.—p. 14.
Effect on Experimental Tuberculosis of Intravenous Injection of Insoluble Substances: Experiments with Carbon. N. P. Markham and H. W. Florey.—p. 25.
Inactivation of Blood Group Receptors on Human Erythrocyte Surface by Periodate Ion. W. T. J. Morgan and W. M. Watkins.—p. 34.

An asterisk (*) before a title indicates that the article is abstracted. Single case reports and trials of new drugs are usually omitted.

British Journal of Radiology, London

24:181-236 (April) 1951

Venographic Localisation of Incompetent Communicating Veins in Leg. J. D. Dow.—p. 182.
Vertebral Retroposition (Reversed Spondylolisthesis). H. W. Gillespie. —p. 193.
Stray Radiation from Diagnostic X-Ray Beams. B. E. Keane and G. Spiegler.—p. 198.
Method of Determining Wavelength Distribution of X Radiation at Point in Scattering Medium. J. R. Greening.—p. 204.
New Design of Radium Safe Embodying Steel Protection and Working to Very Stringent Protection Standards. D. D. Lindsay and J. McKie. —p. 207.

24:237-294 (May) 1951

RADIOLOGY OF SMALL INTESTINE: SYMPOSIUM

I. Studies on Contrast Media for X-Ray Examination of Gastrointestinal Tract. E. A. Zimmer.—p. 245.
II. Small Intestine in Undernutrition. F. R. Berridge.—p. 251.
III. X-Ray Diagnosis of Inflammatory Disease of Small Intestine. R. Prévôt.—p. 256.
IV. Enema of Small Intestine with Special Emphasis on Diagnosis of Tumours. A. Lura.—p. 264.

Localisation of Cerebral Tumours with Radioactive Derivatives of Fluorescein: Physical Limitations. E. H. Belcher and H. D. Evans. —p. 272.
Some Preliminary Clinical Observations on Use of Radioactive Isotopes for Localisation of Brain Tumours. J. G. de Winter.—p. 280.
Effect of Ionizing Radiations on Broad Bean Root. L. H. Gray and M. E. Scholes.—p. 285.

British Journal of Surgery, Bristol

38:257-400 (Jan.) 1951

*Benign Giant-Cell Synovioma: Investigation of 85 Cases. C. J. E. Wright. —p. 257.
Posterior Mediastinal Goitre: Report of Three Cases. J. S. Tomkinson. —p. 271.
Hernial Repair by Whole-Skin Graft: With Report on 413 Cases. A. W. B. Strahan.—p. 276.
Varicose Ulcer: Study of Deep Veins with Special Reference to Retrograde Venography. H. E. Lockhart-Mummery and J. H. Smitham. —p. 284.
Cerebral Angiography. J. B. Curtis.—p. 295.
Expectant Treatment of Pyogenic Infections of Hand: With Special Reference to Infection of Flexor Aspect of Fingers. I. Gordon.—p. 331.
Ruptures of Rotator Cuff. H. F. Moseley.—p. 340.
Partial Gastrectomy in Treatment of Bleeding Peptic Ulcer: Report on 50 Consecutive Operations. K. O. Parsons and L. W. Aldridge.—p. 370.
Primary Actinomycosis of Breast. J. A. L. Davies.—p. 378.
Separation of Portion of Liver Following Gunshot Wound of Abdomen. S. Mottershead.—p. 382.
*Case of Reduplication of Transverse Colon. T. T. Higgins.—p. 392.

Benign Giant-Cell Synovioma.—The occurrence of benign giant-cell synovioma is reported in 85 patients, 55 of whom were females. The site of election of the lesion is the hand (69 patients) and particularly the digits, which were involved in 56 patients. The extensor aspect of the digits was as frequently involved as the flexor, the synoviomas on the extensor aspect probably arising from interphalangeal joint synovium. The average duration of the tumors at the time of the first consultation was two years and seven months. Nineteen (40%) of the 48 patients from whom information as to injury was obtainable gave a history of trauma to the site of growth. Benign giant-cell synovioma arising from a tendon sheath or small joint has a villous structure in its early stages, which often persists. Eventually, owing to the lack of space in the synovial cavity, the tumor grows outward as an encapsulated neoplasm. Encapsulation is often absent on the deep aspect, where the tumor blends with its synovial attachments. The most characteristic histological feature is the differentiation into synovial-lined spaces within the tumor substance. Microscopically the tumors removed from the author's patients included all gradations from the typical benign form to a more cellular variety of intermediate malignancy, which in turn is closely related to the malignant synovioma. Fifty-four patients were followed up after the primary excision of the tumor, and recurrences were observed in 25 patients (48%). The interval between the excision varied from a few weeks to six months. Tumors that recurred were almost invariably of the more cellular variety. Incomplete excision of the tumor or its synovial attachments is probably the most important cause of recurrence. Local excision is indicated in every case whether primary or recurrent, provided this is anatomically possible. The lesion is to be considered truly neoplastic, but it does not metastasize. Blood-cholesterol was not elevated in 17 investigated cases. The lipoid accumulations and the siderosis commonly observed in these tumors are of degenerative or traumatic origin or both and are purely local phenomena, in part related to the well-known phagocytic power of the synovial cell.

Reduplication of the Transverse Colon.—A girl 5, with severe abdominal distention, intractable constipation from birth, and poor general health is reported on. Examination of her abdomen revealed marked tympany and intermittent gross peristaltic waves. The rectum was empty of feces but distended with gas. The outstanding feature of the roentgenogram was a huge sac in the upper left abdomen showing a fluid level surmounted by a gas collection. Laparotomy revealed a large diverticulum arising from the proximal segment of the transverse colon. The ballooned blind sac of the diverticulum filled the upper left abdomen, compressing the stomach and thrusting up the diaphragm, and was covered by remnants of the transverse mesocolon. The narrower "stalk" reduplicated the transverse colon and, in its proximal segment, had a common lumen. The muscular coats were clearly conjoined and the vascular supply inseparable. Resection was the only feasible procedure. The child made an uninterrupted recovery and during a nine month observation period showed normal bowel function.

British Journal of Tuberculosis, London

45:41-86 (April) 1951

Infection and Disease with Special Reference to Tuberculosis. F. Heaf. —p. 41.
Relationship Between Clinical and Pathological Aspects of Bronchial Carcinoma. M. Bariety.—p. 52.
Endo-Bronchial Tuberculosis. J. Smart.—p. 61.
Mediastinitis Produced by Penetrating Foreign Body Impacted in Oesophagus. N. Asherson.—p. 69.
Tuberculin Survey of Children Attending Chest Clinic. W. D. Gray. —p. 74.

British Medical Journal, London

1:899-966 (April 28) 1951

Mass Radiography Findings in Northamptonshire Boot and Shoe Industry, 1945-6. A. Stewart and J. P. W. Hughes.—p. 899.
*Haemophilia Associated with Normal Coagulation Time. C. Merskey. —p. 906.
*Myrmecia: Study of Inclusion Bodies in Warts. A. Lyell and J. A. R. Miles.—p. 912.
Clinical Syndrome Associated with Kimmelstiel-Wilson Lesion of Kidney. I. Gilliland.—p. 916.
Benign Calcified Epithelioma. J. L. Temple.—p. 920.
Glinski and Aetiology of Simmond's Disease (Hypopituitarism). J. D. Robertson.—p. 921.
Two Cases of Simmond's Disease Due to Post-Partum Necrosis of Pituitary Gland. W. Hausmann, S. Kalinowski and H. S. Le Marquand. —p. 924.

Hemophilia with Normal Coagulation Time.—The absence of antihemophilic globulin in hemophilic blood can be used as a diagnostic test for this condition, if minimal amounts of the blood of a patient suspected of having hemophilia are added to known hemophilic blood. If the suspected blood proves incapable of correcting the coagulation time and prothrombin consumption defect, the patient probably has hemophilia. If its ability to correct these defects is less than that of an equal proportion of normal blood, the patient probably has the hemophilic defect, but in less degree. By the use of this test in hemophilic patients Merskey showed that varying grades of the hemophilic defect exist. At the one extreme were the classic hemophiliacs with prolonged coagulation time, grossly defective prothrombin consumption, and inability to correct hemophilic blood; at the other extreme were patients with normal coagulation time, a much milder prothrombin consumption defect, and a partial ability to correct hemophilic blood. This paper is a report of 14 cases of hemophilia occurring in eight families in whom coagulation times and the results of other common blood tests were normal in the majority of instances. The blood of these patients was ineffective in correcting the defects of known hemophilic blood, however, and clinically there was no doubt that these persons had hemophilia. The author shows that it is dangerous to rely on the common bleeding and clotting tests to exclude hemophilia.

Inclusion Bodies in Warts.—On the assumption that warts were due to a virus Lyell and Miles looked for inclusion bodies in sections of warts taken from 10 patients. They found that five of the patients' warts contained eosinophilic intranuclear and intracytoplasmic bodies in the prickle-cell layer and in the belief that these were inclusion bodies the authors named these warts type I, for "inclusion." Warts from the remaining five patients were devoid of these eosinophilic bodies, and such warts were named type B, for "banal," because of their commonplace histology. Subsequently, the warts from 102 consecutive patients were examined. The type I warts were mostly plantar, palmar, subungual, or on the pulp of a digit, whereas the type B warts were predominantly common warts of the fingers, face, scalp, and knees. The type I warts were deeply set in the skin, in contrast with type B warts, which were set superficially. Type I warts looked like little molehills with domed tops, while the type B ones were typical warty excrescences. Type I warts lay in a flask-shaped cavity, wider at the bottom than the top, while type B warts lay in a saucer-shaped depression. The authors are uncertain of the relationship between the two types, but the recurrence of some type I warts as type B and the discovery of an intermediate type suggest that type I warts are a variety of type B. However, other evidence (a transmission experiment and a clinical case in which the warts bred true) indicates an absolute distinction between the types. The type I warts are the same entity as the myrmecia of Celsus, the vascular excrescence of Durlacher, and the plantar wart of Dubreuilh. Plantar warts called the mosaic type are histologically type B. It is suggested that the term "verruca vulgaris" be confined to type B warts and that type I be renamed "myrmecia."

1:967-1034 (May 5) 1951

Physiology of Neuromuscular Transmission and Neuromuscular Block. W. Feldberg.—p. 967.
Eosinophil and Other Leucocyte Changes in Burned Patients, with Special Reference to Adrenocortical Activity. S. Sevitt.—p. 976.
Some Observations on Survival of Pathogenic Bacteria on Cotton-Wool Swabs: Development of New Type of Swab. S. D. Rubbo and M. Benjamin.—p. 983.
*Investigation into Effects of Aureomycin and Chloramphenicol in Herpes Zoster. A. B. Carter.—p. 987.
*Expectant Treatment of Perforated Peptic Ulcer. A. D. Beattie.—p. 992.
Significance of Raised Serum-Enzyme Levels in Perforated Peptic Ulcer. H. Wapshaw.—p. 995.

Aureomycin and Chloramphenicol in Herpes Zoster.—Forty-four patients with herpes zoster were divided for treatment in four groups of 11 patients each. The first group of patients served as controls and was given dextrose. The second group was given 2 gm. of aureomycin daily for six days. The third group received 4 gm. of aureomycin daily for four days. The fourth group was given 2 gm. of chloramphenicol (chloromycetin®) daily for six days. The controls were selected at random, and the observers did not know which patients were in this group. No significant difference was found between the groups in respect to amount and duration of herpetic pain, paresthesias, or the appearance of new herpetic lesions. Treatment with either aureomycin or chloramphenicol within the first week of the rash shortened the pustular stage so that desquamation was earlier and scarring less. All the patients treated with aureomycin and all but two of those treated with chloramphenicol were free from secondary infection, which was present in all the controls. The effect of the antibiotics thus can reasonably be attributed to their action on the secondary infection. Two patients with dramatic amelioration of symptoms have been reported on in detail; one was treated with aureomycin, and the other was a control. In view of these results, it seems that such expensive drugs should be employed only in very severe cases, particularly ophthalmic zoster, occurring in elderly or debilitated patients.

Expectant Treatment of Perforated Peptic Ulcer.—Expectant treatment was practiced in 40 unselected patients with acute perforated peptic ulcer, of whom 32 had duodenal ulcers, seven had gastric ulcers, and one had carcinoma of the stomach. Treatment consisted of immediate aspiration of the stomach contents, continuous gastric suction, repeated injection of morphine, and intravenous infusion. The patients were kept under constant control during the first 48 hr. of expectant treatment, and laparotomy was performed if there was no obvious clinical improvement. Four patients died, and the treatment failed in five patients. Thirty-one of the 32 patients with perforated duodenal ulcer recovered under expectant treatment, but only one out of four patients with anterior perforations of the stomach survived. In 13 of the 36 surviving patients either localized pneumonitis or basal collapse developed. The incidence of chest complications thus was approximately the same as that following surgical treatment of perforated peptic ulcer. As the result of these experiences the author has now abandoned the expectant method of treatment in favor of early laparotomy in every case. If the perforation is found to have sealed adequately, either by adhesion to the liver or by means of an omental plug, the abdomen is closed again with no further surgical intervention, and conservative treatment is then instituted. Actual operative closure of the perforation is normally reserved for cases in which there is apparently no spontaneous sealing, though it is done routinely in every instance of anterior gastric ulcer.

Canadian Medical Association Journal, Montreal

64:387-476 (May) 1951

Pathogenesis of Atherosclerosis. G. L. Duff.—p. 387.
Treatment of Pyogenic Skin Infections with Bacitracin Ointment. N. M. Wrong, R. C. Smith, A. L. Hudson and H. C. Hair.—p. 395.
Symptomatology and Development of Stuttering. E. Douglass.—p. 397.
*Diagnosis of Early Cancer of Large Bowel and Rectum. N. A. McCormick.—p. 403.
Bronchogenic Carcinoma: Analysis of 94 Cases. J. D. Stenstrom.—p. 409.
Post-Traumatic Cerebral Syndromes. J. C. Richardson.—p. 414.
Fibrocystic Disease of Pancreas. V. Abbott, J. F. McCreary, R. Pocock and A. Brown.—p. 419.
Coeliac Syndrome. J. F. McCreary, V. Abbott, R. Pocock and A. Brown.—p. 424.
Onchocerca Volvulus in Angola, Africa. W. E. Strangway and A. K. Strangway.—p. 427.
Intravenous Morphine in Ocular Surgery. E. A. Johnson.—p. 429.
Aneurysm of Pulmonary Artery. M. G. Israels.—p. 433.
Cerebral Vascular Accidents. D. Parkinson.—p. 436.
Use of Popliteal and Saphenous Vein, and Superficial Vein of Neck for Intravenous Drip Infusion. A. Woloszczuk.—p. 439.
*Poison Ivy. F. A. Clarkson.—p. 448.

Diagnosis of Cancer of Large Bowel.—Cancer of the large bowel is the commonest variety of cancer and accounts for 15% of all deaths from cancer. Since early stages of cancer cause no symptoms, detection depends on careful physical examination. Seventy per cent of the cancers occurring in the colon or rectum are either palpable to the examining finger or within reach of the sigmoidoscope. While a cancer may sometimes be detectable in an unprepared rectum, it is absolutely impossible to eliminate the likelihood of cancer being present in a patient whose bowel has not been properly evacuated. The local examination in women should always commence with the vagina, because it frequently is possible to obtain considerably more information about a rectal cancer from a vaginal examination than by an examination of the rectum proper. In addition to the digital examination, sigmoidoscopic examination has proved very useful, but the author feels that x-ray investigation plays no part in the diagnosis of cancer of the rectum. If examination of the rectum discloses no cancer, then the colon should be investigated. Here a thorough roentgenologic study, including both fluoroscopy and radiography, is advisable after administration of a barium enema. Barium given by mouth may cause intestinal obstruction and even perforation. The following symptoms are suggestive of cancer of the colon or rectum: bleeding, alteration in bowel function, and abdominal discomfort. At the author's hospital, where 277 patients with cancer of large bowel or rectum were treated in the course of 14 yr., the proportion of patients with cancer of the rectum who were operable when the diagnosis was made has gradually increased to 72%. The hospital mortality has dropped to 3%, and 52% of all patients in whom resection was done have lived for five or more years. Essentially similar results have been obtained in patients with cancer of the colon. A small number of patients with rectal cancer are amenable to cure by irradiation.

Poison Ivy.—After discussing the terminology of the plants of the genus Rhus, which produce dermatitis, Clarkson says that nothing that approaches a cure has been added to the pharmacopeia. There is now enough evidence showing that injections of various extracts are of no value. Various ointments have been found helpful, but they do not cure. In the course of the disease erythema and itching appear 48 hr. after contact, reaching a maximum in four or five days; vesicles appear on the third day, last a week, and then gradually dry. The itching is usually gone in 10 days.

Deutsche medizinische Wochenschrift, Stuttgart

76:501-536 (April 13) 1951. **Partial Index**

Importance of Some Secondary Factors in Cure of Carcinoma of Cervix Uteri. H. Runge and H. Wimhöfer.—p. 501.
Neurohormonal Regulation of Female Genital Function. W. Bickenbach and G. K. Döring.—p. 504.
*Problem of Interruption of Pregnancy and Sterilization in Familial Erythroblastosis. P. Dahr.—p. 513.
*Sex Gland Hormones in Therapy. C. Kaufmann.—p. 519.

Pregnancy and Familial Erythroblastosis.—Experience with erythroblastosis in 700 families suggests that from the medical point of view interruption of pregnancy should be permitted only in a woman who already has given birth to one dead infant, who in the third to fourth months of a new pregnancy shows blocking (univalent) Rh antibodies the titer of which increases rapidly up to the end of the fourth month of pregnancy, and who during the first two months of her pregnancy had no Rh antibodies in her blood. Interruption of pregnancy should not be considered if the absence of blocking antibodies has not been demonstrated during the interval between the two pregnancies or during the first two months of the new pregnancy, because Rh antibodies found in one pregnancy may have been present continuously since a previous pregnancy. Sterilization of a woman from a family with erythroblastosis may be permissible from the social point of view, provided that there have been several stillbirths and that the birth of a healthy child apparently may no longer be expected. But even if in such a case sterilization would be legally permissible, it is not justifiable medically, because it is still possible that such a woman may give birth to a healthy child conceived from a Rh-heterozygous man or from any Rh-negative man.

Sex Gland Hormones in Therapy.—Psychosomatic interrelationship plays an important part in functional sex disturbances. Recognition of this fact is of greatest importance in therapy. Functional sex disturbances due to psychic injury resulting from changes of the environment are reversible in the majority of cases, once the injurious influence has been removed. Accurate determination of basal body temperature over a prolonged period of time is of diagnostic significance. Estrogenic substances are of great value for the removal of severe menopausal symptoms, the so-called functional endocrine disturbances. Although encouraging words and sedatives may be sufficient in half these patients, repeated injections of 10 mg. crystalline estradiol suspension in oil at three month intervals are recommended by the author for the other patients. Bleeding may be induced in women over 20 with amenorrhea of more than six months' duration by a single injection of either 10 mg. crystalline estradiol suspension or 50 mg. crystalline progesterone suspension. If bleeding does not occur within three weeks, six injections of 5 mg. of estradiol dipropionate over a period of 21 days should be combined with one injection of 50 mg. progesterone suspension on the 14th day; cyclic bleeding will be obtained by this method, provided that treatment is continued for more than three months. The implantation of even small doses of crystalline estrogenic steroids creates unphysiological conditions and is not without risk in women whose uterus has not been removed. Treatment of functional bleeding with large doses of 200 to 400 mg. of progesterone seems to offer a favorable prognosis. In patients with dysmenorrhea caused by endometriosis, pain relief may be obtained by administration of 150 mg. of testosterone in six divided doses of 25 mg. The use of estradiol, progesterone, and testosterone in physiological doses is without risk and is not carcinogenic. It is not likely that abortion may be induced by estrogenic substances.

Edinburgh Medical Journal

58:41-104 (Feb.) 1951

Uncommon Drug Rashes. G. A. G. Peterkin.—p. 41.
Protein Hydrolysate: Part I. Physiological Effects and Utilisation. B. Billing, J. B. Donald, C. P. Stewart and A. W. Wilkinson.—p. 52.
Id.: Part II. Therapeutic Applications. B. Billing, J. B. Donald, C. P. Stewart and A. W. Wilkinson.—p. 64.
Incidence of Psychiatric Cases in General Practice. G. M. Carstairs. —p. 72.
Anaesthesia in Surgery of Pulmonary Tuberculosis. H. B. Wilson.—p. 82.
Case of Torsion Dystonia. B. M. Allen.—p. 88.
Phosphatase in Dried Seminal Stains. J. S. Faulds.—p. 94.

Hospital, Rio de Janeiro

39:465-590 (April) 1951. **Partial Index**

*Comparative Study of Wassermann, Kahn and Kline Tests. E. Russo. —p. 491.
BCG Vaccination. J. Lins Monteiro Da Franca.—p. 539.

Comparative Study of Wassermann, Kahn, and Kline Tests.—Russo performed the Wassermann, Kahn, and Kline tests on a total of 8,802 specimens of blood serum of treated and untreated syphilitics. The results of these tests were in agreement in 7,990 samples (92.3%) and divergent in 812 samples (7.7%). The Wassermann test agreed with the standard Kahn and diagnostic Kline in 91.9% and 91.2% of the samples, respectively. The standard Kahn agreed with the diagnostic Kline in 98.2% of the samples. Positive results were obtained in 30.1% of samples with the Wassermann test, 37.0% with the Kahn test, and 37.7% with the Kline. The results show that Kline's microflocculation test is the most sensitive and the Wassermann the least sensitive.

Journal of Laryngology and Otology, London

65:133-216 (March) 1951

Aetiology of Swimmer's Exostoses of External Auditory Canals and of Associated Changes in Hearing. W. S. Adams.—p. 133.
Observations on Disturbances of Equilibrium and Other Symptoms Induced by Jet-Engine Noise. E. D. D. Dickson and D. L. Chadwick. —p. 154.
Psychogenic Deafness (Emotional Deafness). N. R. Blegvad.—p. 166.
Function of Round Window in Transmission of Sound Waves After Fenestration of Labyrinth. M. van Eyck.—p. 183.
Comparison of Various Methods Employed in Determination of Recruitment Phenomenon. E. Lüscher and J. Zwislocki.—p. 187.

65:217-316 (April) 1951

Aetiology of Swimmer's Exostoses of External Auditory Canals and of Associated Changes in Hearing. W. S. Adams.—p. 232.
Studies on Inertia of Cupula. T. Vilstrup.—p. 251.
Fenestration Operation: Experience of First 96 (Consecutive) Cases. R. Thomas.—p. 259.
Epistaxis: Investigation into Nasal Haemorrhage. S. Horowitz.—p. 275.

Journal of Pathology and Bacteriology, Edinburgh

63:1-180 (Jan.) 1951. **Partial Index**

Circulatory Responses to Variations in Intra-Abdominal Pressure. D. S. Ridley.—p. 17.
Local Production of Antibodies. C. L. Oakley, I. Batty and G. H. Warrack.—p. 33.
Identification of Staphylococcus Pyogenes by Phosphatase Reaction. M. Barber and S. W. A. Kuper.—p. 65.
*Two Cases of Giant-Cell Granuloma of Pituitary Gland. I. Doniach and E. A. Wright.—p. 69.
Effects of Anterior Hypophysis Hormones, Alone and with Some Other Hormones, on Ageing Female Rats. V. Korenchevsky and S. K. Paris. —p. 111.
Gross Tumour Embolism of Axillary Artery by Malignant Synovioma. T. G. E. Loosemore and J. W. Whittick.—p. 133.
Smooth-Muscle Tumours of Gastro-Intestinal Tract and Retroperitoneal Tissues Presenting as Large Cystic Masses. G. Lumb.—p. 139.

Giant-Cell Granuloma of Pituitary.—Doniach and Wright report two cases of giant-cell granuloma of the anterior pituitary. In 1917 Simmonds discovered and described four cases of this disorder; in 1949 Sheehan and Summers grouped 18 cases, including Simmonds' four cases, under the heading of "giant-cell granuloma." The present authors agree with Sheehan and Summers that "the group may include lesions due to several different causes, such as syphilis, tuberculosis, or sarcoidosis, but that most of the cases appear to be examples of a specific disease process whose etiology is unknown." The studies of Doniach and

Wright led to no positive conclusion as to the etiology of pituitary giant-cell granuloma. Like previous observers, they interpret the lesion histologically as a primary parenchymatous necrosis of the pars anterior of the pituitary rather than as a destructive infiltration by an infective granuloma, but they admit this interpretation is weakened by the finding of granulomatous lesions, admittedly differing in detailed morphology, in other parts of the body. Although tuberculosis, syphilis, and sarcoid were all considered as possible etiologic factors, none could be accepted or rejected.

Lancet, London

1:807-862 (April 14) 1951

Fads and Fancies: Thirty Years of Tuberculosis. C. Cameron.—p. 807.
Pneumoconiosis: Histological Survey of Necropsy Material in 1,205 Cases. S. R. Gloyne.—p. 810.
Bleeding Peptic Ulcer. D. A. Ferguson and A. L. Wyman.—p. 814.
Stilboestrol Sulphate, Oestrone, and Equilin: Further Observations on Potency and Clinical Assessment of Oestrogens. P. M. F. Bishop, N. A. Richards and W. L. M. Perry.—p. 818.
Serum-Protein Levels of Samoans, Fijians and Indians in Fiji. L. Wills and M. E. Bell.—p. 820.
Recovery of Human Red Blood-Cells After Freezing. H. A. Sloviter. —p. 823.
There Are No Urethral Caruncles. R. C. Begg.—p. 824.
Properties and Limitations of Cation-Exchange Resin: Laboratory Investigation of Zeo-Karb 225. F. Morton.—p. 825.
Congenital Indifference to Pain. H. G. Farquhar and T. Sutton.—p. 827.
Calcium Metabolism in Hyperthyroidism: Effect of Thiouracil. J. Green and A. Lyall.—p. 828.
Repair of Cervical Trachea and Larynx. E. Lewis.—p. 830.
Therapeutic Effect of Allergic Reaction to Food on Rheumatoid Arthritis. L. G. Polymenakos.—p. 831.

1:863-918 (April 21) 1951

Mind and Matter. W. R. Brain.—p. 863.
Thigh-Neck Clearance: Simplified Radioactive Test of Thyroid Function. J. B. Foote.—p. 868.
Synchronous Combined Abdomino-Vaginal Hysterectomy. J. Howkins. —p. 872.
Determination of Haemoglobin: VII. Standardised Optical Data for Absolute Estimations. R. Donaldson, R. B. Sisson, E. J. King and others. —p. 874.
Radiological Diagnosis of Emphysema. J. M. S. Knott and R. V. Christie. —p. 881.
*Costal Chondritis (Tietze's Disease). E. H. W. Deane.—p. 883.
Epileptiform Fits During Calciferol Therapy. J. M. Beare and J. H. D. Millar.—p. 884.
Hypercalcaemic Uraemia with Nephrocalcinosis Due to Carcinomatosis. R. M. Fulton and G. E. Paget.—p. 886.
Unicellular Sebaceous Glands in Basal Layer of Normal Human Epidermis. E. Wolff.—p. 888.
Excretion of Methonium Compounds. G. E. Milne and S. Oleesky. —p. 889.
*Streptomycin in Letterer-Siwe's Disease. R. P. Aronson.—p. 889.

Costal Chondritis.—Deane presents the histories of seven patients who had painful nonsuppurative swelling of costal cartilages, a disorder usually referred to as Tietze's disease, because Tietze first described this entity, in 1921. At that time malnutrition was regarded as a possible cause. The cases observed by Deane all involved the second costal cartilage, but other workers reported involvement of any, or in some cases several, cartilages from the first to the 10th. The second seems to be involved oftener than any other. Whether the swelling involves the cartilage or the perichondral tissues is difficult to determine. It is sharply demarcated laterally by the costochondral junction, over which tenderness may be more acute than over the cartilage. In all the cases referred to Deane a tuberculous infection was suspected, but in only one case was there evidence of such an infection, and in this case the pulmonary lesion was inactive. The swelling and pain gradually subside, but some residual swelling may remain indefinitely. Investigation of erythrocyte sedimentation rate, Wassermann reaction, and blood cell counts failed to yield significant findings. Though the pathological basis has not yet been determined, the patient may be reassured that the lesion is benign. No treatment is necessary except rest of the arm on the affected side and the application of heat when the swelling is painful.

Streptomycin in Letterer-Siwe's Disease.—Presenting a classification of the reticuloses, Aronson says that Letterer-Siwe's disease is one of the nonlipoid reticuloses, the main features of which are enlargement of liver and spleen, a hemorrhagic tendency that manifests itself as petechiae or purpura, generalized enlargement of lymph nodes, cyst formation and tumors in bones, progressive secondary anemia, and generalized hyperplasia of macrophages in spleen and other organs. The disease is seen only in infants and ends fatally. It is not hereditary. The case described here first appeared as a hemolytic anemia but was otherwise typical. The diagnosis was not made until histological examination of the spleen had been completed. Splenectomy appeared to arrest the hemolytic process, but otherwise the child's condition was not greatly altered. A preliminary examination of the spleen had suggested a diagnosis of sarcoidosis, and, as sarcoidosis is thought by some to represent an atypical response to the tubercle bacillus and the response to splenectomy had not been very dramatic, it was decided to try streptomycin. Treatment lasted five weeks. Seven days after streptomycin treatment started, the enlarged cervical glands were no longer palpable, the temperature had begun to settle, and for the first time the body was entirely free from petechiae. The child has remained well now for over two years. All previous cases have progressively deteriorated, the longest survival being two years. Though the etiology of Letterer-Siwe's disease is unknown, various kinds of sepsis or reactions to as yet undetermined toxins may be factors. The favorable response to streptomycin lends some support to this theory.

1:919-972 (April 28) 1951

Our Knowledge of Menstrual Cycle, 1910-1950. G. W. Corner.—p. 919.
Empyema Thoracis Treated with Penicillin and Aspiration Only. R. Asher and D. Davies.—p. 924.
Electrocardiographic Findings During Operative Manipulation of Viscera and Vagus Nerves. A. G. Freeman.—p. 926.
*Cyanosis in Infancy from Nitrates in Drinking-Water. M. C. Ewing. —p. 931.
*Epidemic of Aniline Methaemoglobinaemia in Newborn Babies. B. E. Howarth.—p. 934.
*Familial Idiopathic Methaemoglobinaemia. V. K. St. G. Breakey, Q. H. Gibson and D. C. Harrison.—p. 935.
Non-convulsive Stimulation Therapy: New Psychiatric Treatment. W. L. Milligan.—p. 938.
Vitamin-B Deficiencies After Gastric Operations. R. Welbourn, R. Hughes and C. Wells.—p. 939.
Actinomycosis of Spine. M. E. Winston.—p. 945.

Cyanosis From Nitrates in Well Water.—This is the first report from England of well water cyanosis in infants. Two infants, 4 weeks and 6 weeks of age respectively, were given in their formulas water from shallow wells contaminated with coliform organisms and nitrates. Both became cyanotic and showed methemoglobinemia. One died before admission to the hospital, the other recovered following exchange transfusion. This condition is apparently limited to the first few weeks of life, during which time the physiological hypochlorhydria of infancy permits the growth of lower bowel organisms (Escherichia coli, Aerobacter aerogenes, and E. freundii) in the upper gastrointestinal tract. These organisms reduce ingested nitrates to nitrites, which are absorbed in the small intestine. The nitrites oxidize hemoglobin to methemoglobin, and the infant becomes cyanotic. Water containing more than 20 ppm of nitrates should be regarded as unsafe for infant consumption. Boiling does not reduce the nitrate content of such water. Once this type of cyanosis has developed in an infant, the recommended treatment is the intravenous injection of methylene blue, 1 or 2 mg. per kilogram of body weight.

Aniline Methemoglobinemia in Infants.—A sudden outbreak of cyanosis in 23 infants in the nurseries of a maternity hospital is reported. The cause was the absorption of aniline dye from fresh marking ink on diapers that had not been laundered. This had produced methemoglobinemia in the infants. After withdrawal of the incriminated diapers the babies were divided into three groups. One group was treated with methylene blue (1 to 2 ml. of a 1% solution given intravenously), another with ascorbic acid (50 mg. orally before each feeding), and the third group was left untreated. The babies treated with methylene blue responded dramatically. The ascorbic acid and control groups recovered at about equal rates but more slowly than the methylene blue group. Four of the premature infants required blood transfusions for anemia. One died two months later and at autopsy was found to have ulcerative enteritis, thrombophlebitis of the superior mesenteric and portal veins, and splenomegaly with fibrosis. Absorption of aniline dyes from laundry marking ink can be prevented if the article of clothing is laundered before use.

Familial Idiopathic Methemoglobinemia.—The authors report two cases of familial idiopathic methemoglobinemia in children aged 3½ yr. and 6 yr. respectively. Both were cyanotic from birth, and one was thought to have congenital cardiac disease. Both developed normally, however, and showed no dyspnea. No other available members of the patients' families were found to have methemoglobinemia. This supports the belief that the disease is inherited as a recessive character. The erythrocytes of these patients showed an abnormally low capacity to reduce methemoglobin in the presence of glucose or lactate and an abnormally low activity of diaphorase I (coenzyme factor I). This defect in the reducing system of the cells is thought to be responsible for the symptoms in this disease. Since there is a continuous slow oxidation of hemoglobin to methemoglobin in the blood, any decrease in activity of the reducing systems of the erythrocytes permits an accumulation of methemoglobin. The patients reported on were treated successfully with methylene blue and ascorbic acid.

1:973-1024 (May 5) 1951

*Diagnosis and Treatment of Bulbar Poliomyelitis. W. H. Kelleher. —p. 973.
Myeloid Reticulosis: Its Diagnosis and Course. M. C. G. Israëls.—p. 978.
Complications of Intravenous Fluid Therapy in Children. R. M. Todd. —p. 982.
Diaphragmatic Flutter. C. G. Baker and A. B. Shaw.—p. 985.
*Paralytic Poliomyelitis Following Injury. A. B. Harrington.—p. 987.
Generalized Scleroderma with Intestinal Involvement. C. B. Prowse. —p. 989.
Experiments of Fat Absorption in Case of Chylothorax. W. H. R. Auld and C. D. Needham.—p. 991.
Colonic Replacement of Stomach. J. Moroney.—p. 993.
Nature of Auto-Agglutinins. G. W. G. Bird.—p. 997.
Bacillaemia Due to Shigella Sonnei: Report of Case. P. Tatham, T. P. Williams and G. T. Stewart.—p. 997.

Bulbar Poliomyelitis.—Both the incidence and the severity of bulbar lesions can vary in different epidemics of poliomyelitis. Among all poliomyelitis cases observed at Kelleher's hospital in 1947 a higher than usual proportion of bulbar cases was observed, but the severity of the cranial-nerve lesions was much less than had been anticipated from impressions of the danger of these lesions gathered in the prewar years. In 1949, on the other hand, he met with a disturbingly higher proportion of dangerous forms of bulbar attack. Not long ago it was accepted that patients with the more dangerous types of bulbar poliomyelitis would die, regardless of treatment. Recently, however, more favorable results have supposedly been obtained, both through a better recognition of the factors producing symptoms and through a better application of the principles of therapy. From experiences at his hospital and from a study of the American literature Kelleher believes that tracheotomy and other appropriate remedial measures should be considered for the cases of poliomyelitis in which dangerous bulbar lesions interfere with free oxygenation. The poliomyelitis team should include an anesthetist and a laryngologist, who should be prepared to perform tracheotomy as a carefully planned measure of prevention rather than as a cure of the dangerous sequelae of respiratory obstruction.

Paralytic Poliomyelitis Following Injury.—It has been established that in children recently subjected to tonsillectomy, poliomyelitis is especially likely to take the bulbar form and that not only the site but also the incidence and severity of paralysis may be affected by prophylactic inoculations. In patients with paralytic poliomyelitis muscle weakness has been observed in limbs that had sustained trauma. This paper gives the histories of five patients in whom trauma preceded the appearance of paralytic poliomyelitis by a few days. These five cases were found in a review of the records of 100 cases, and in each of the five cases paralysis appeared in muscles closely related to the site of trauma. Possible factors in the production of this paralysis are briefly discussed.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

95:1121-1216 (April 14) 1951. **Partial Index**

*Treatment of Chronic and Relapsing Tonsillitis with Roentgen Rays. M. de Jong.—p. 1137.
Bacteroides Infections. H. Beeuwkes, J. B. M. Vismans and A. H. Smeets.—p. 1143.
*Importance of Bronchi in Primary Pulmonary Tuberculosis. G. M. H. Veeneklaas.—p. 1153.

Roentgen Irradiation in Tonsillitis.—Roentgen irradiation was employed in 60 patients with chronic or relapsing tonsillitis. On the first day, following anesthesia with a tetracaine (pontocaine®) hydrochloride spray contact irradiation was given on a field measuring 20 by 28 mm. Dosage per tonsil was 400 r. The tube was directed so that the entire tonsil was in the ray field. Externally the rays were applied to a field 8 by 8 cm. with a focus-skin distance of 40 cm., with a tension of 180 kv., and with a 0.5 mm. copper filter. Both tonsils were irradiated on the same day. The dosage on the skin (measured in air) was 150 r. On the third day the two external fields were irradiated as on the first day. On the fifth day the procedure was again as on the first day. All patients were reexamined from two to three years later. Thirty patients were cured, and 22 were greatly improved. Tonsillectomy became necessary in 12 of the patients, but in nine of these the roentgen irradiation had not been completed. The author recommends a wider application of irradiation in chronic tonsillitis.

Involvement of Bronchi in Pulmonary Tuberculosis.—Primary pulmonary tuberculosis is considered as chiefly located in the lungs. The importance of the bronchi in this disease receives slight attention. Reports in the literature, theoretic considerations, and his own observations convinced Veeneklaas that the bronchi are probably involved in the majority of cases of primary pulmonary tuberculosis and that pulmonary shadows are generally the result of bronchial lesions. Rupture of lymph nodes into the bronchi is more frequent than is suspected.

95:1217-1276 (April 21) 1951. **Partial Index**

Difficulties in Surgical Treatment of Severe Hematemesis. N. G. Geelkerken and J. D. Bom.—p. 1224.
Renal Echinococcosis. A. Pasma.—p. 1229.
Infectious Myositis. J. Bonnet.—p. 1233.
*Treatment of Tetanus with Large Doses of Refined Tetanus Antitoxin Globulins. H. Verhagen.—p. 1247.

Tetanus Therapy with Large Doses of Refined Tetanus Antitoxin Globulin.—According to some observers, the length of the incubation period is the decisive factor in the prognosis of tetanus; that is, if it is seven days or less, tetanus is nearly always fatal, whereas if it is longer than nine or 10 days, a large percentage of recoveries can be obtained by serum therapy. Verhagen believes that the type of antitoxin is also vitally important and describes his experiences with a refined tetanus antitoxin globulin containing much less protein than do other antitoxin preparations and with a much greater (10 fold) concentration of antitoxin (10,000 units per cubic centimeter). This makes it possible to administer much greater quantities of antitoxin in a smaller amount of fluid and with fewer foreign proteins. The author describes the histories of three patients who recovered following the use of this antitoxin. Their incubation periods were 12, seven, and eight days, respectively. The initial doses of refined antitoxin administered intravenously to these three patients were 200,000, 100,000, and 150,000 units, respectively. Smaller doses of the refined antitoxin were given after intervals of several days.

Nordisk Medicin, Stockholm

45:461-500 (March 28) 1951. **Partial Index**

*Pethidine-Nitrous Oxide Anesthesia Without Barbiturate Supplement. H. Ruben and A. K. Andreassen.—p. 464.
Ureteral Anesthesia with Highly Viscous Preparation (Xylocaine-Gel Astra). R. Romanus.—p. 466.
Conteben Damage: Hypothyroid Goiter, Cerebral Edema, Death. N. Bergqvist and O. de Maré.—p. 474.
Artificial Myxedema During Paraaminosalicylic Acid Administration. K. H. Clausen and K. Kjerulf-Jensen.—p. 475.

Meperidine-Nitrous Oxide Anesthesia Without Barbiturate Supplement.—In 59 cases from the surgical division of the Finsen Institute, mostly in elderly patients regarded as poor risks, nitrous oxide anesthesia supplemented by meperidine (pethidine) hydrochloride was employed. The average duration of the operation was three hours. Ruben and Andreassen found that with this combination anesthesia there was little or no impairment of normal function. The urinary output was sufficient, and intestinal peristalsis was active throughout the anesthesia. The compensatory mechanism of the circulatory system functioned well. The patients regained consciousness before they left the operating table and were surprisingly little affected by the anesthesia. Of the three deaths none was attributable to the anesthesia.

45:501-540 (April 4) 1951. **Partial Index**

Clinical and Anatomic Discrepancies in Head Trauma Series. J. Cammermeyer.—p. 504.
*Cancer Focus. F. Bang.—p. 508.
*"Acid Phosphatases" in Fasting Stomach Secretion with Reference to Diagnosis of Cancer of Stomach. F. Rønnike.—p. 512.
Result of Reposition Treatment of Fractures of Vertebral Body. O. Sahlin.—p. 516.
Carcinomatous Meningitis. O. B. Ramse.—p. 517.
Subscapular Muscle Graft According to Magnuson in Recurrent Dislocation of Shoulder. B. Köhler.—p. 519.

Cancer Focus.—Bang concludes that cancer starts as a local affection, which, if left to itself, becomes universal. The primary cancerous tumor or ulceration with degeneration is designated as a cancer focus. In experimental tar cancer three phases are distinguished. In the preparatory phase the tissue changes are reversible. In the preinvasive or latent phase a latent cancer focus has formed and the tissue changes are irreparable; the tissue has become anatomically and physiologically disorganized, and the cells divide abnormally. In the invasive phase the cancer cells have suddenly attained the faculty of invasive growth. Growth impulses, possibly in the form of hormonal influence, appear to be important in the development of cancer, and absence of these may be the reason that latent foci occasionally do not develop. It is suggested that the faculty of invasive growth may depend on an increase in virulence of a viruslike factor, formed in the dividing cells during the preceding phase.

Gastric Acid Phosphatases in the Diagnosis of Cancer.—After determining the acid phosphatase content of gastric secretions in 26 fasting patients, seven of whom had cancer of the stomach, Rønnike concludes that the arbitrary limit of 10 units of phosphatase per 100 cc. of secretion cannot be used to distinguish between the cancerous and noncancerous stomach. Eighteen of the 19 patients in this series without cancer showed phosphatase values higher than 10. In many cases the values were far above those reported by Changus and Dunlap. There was no demonstrable relation between the pH of the stomach contents and the phosphatase values. The phosphatase test was of no apparent value in the diagnosis of cancer of the stomach in this group.

Praxis, Bern

40:383-406 (May 10) 1951

*BCG Vaccination as Means of Combating Tuberculosis. H. Scholer.—p. 383.
Triad of Diaphragmatic Hernia—Diverticulosis—Cholelithiasis. B. Wissmer.—p. 396.

BCG Vaccination.—Experience with BCG vaccination performed on five million to ten million persons over a period of 20 yr. in various European countries, particularly in the Scandinavian countries, suggests that this procedure may be safely recommended, subject to the following considerations: (1) BCG vaccination is permissible only in persons who have not been affected by tuberculosis and (2) it is imperative in persons who have been heavily exposed to tuberculosis and are approaching an age at which they are particularly sensitive to tuberculosis. Persons who have passed through natural primary infection should not be vaccinated. Vaccination is most indicated for small children and nursing infants in a hazardous environment, boys and girls nearing puberty who at the same time are leaving the paternal home, and tuberculin-negative medical and veterinary students and nurses. The greatest disadvantage of the BCG vaccination is its cumbersomeness. The author believes that the application of a living BCG suspension of 75 mg. per cubic centimeter to the skin followed by puncture of the subjacent skin may provide a simplified and improved allergy indicator and may result in simultaneous vaccination of those with negative reactions (Ustvedt's test modified by Delachaux and Bergier). No observers report the occurrence of any general untoward reactions. It may be assumed that tests with living BCG suspension are innocuous in carriers of a manifest or latent allergy (carriers of a primary infection). In those cases in which there is no positive reaction with the occurrence of red nodules after 24 to 72 hr. (early reaction), BCG vaccination by intracutaneous administration of 0.05 to 0.10 mg. of BCG vaccine could be performed easily. It may be assumed that repeated BCG vaccination will be innocuous and may increase the protection provided; it may even prevent or tend to prevent tertiary tuberculosis. The protection period provided by BCG vaccination has not yet been fully determined, but reliable protection should be assumed after two to four months. There are reports on the duration of the tuberculin allergy after vaccination, but this allergy is not identical with immunity. BCG vaccination is the best available prophylactic, and it should not be discredited by uncautious procedures.

Presse Médicale, Paris

59:641-660 (May 12) 1951

Value and Mechanism of Antidotal Action of Sodium Tetrathionate in Hydrocyanic Poisoning. L. Binet, G. Wellers and J. Dubrisay.—p. 641.
*Qualitative and Statistical Comparison of Symptomatology of Gastric and Duodenal Ulcers. P. Chêne, J. M. Gorse and A. Eyrolle.—p. 643.
Encephalographic Study of Acromegaly. E. Garcia Austt Jr. and J. C. Mussio Fournier.—p. 645.

Clinical Aspects of Gastric and Duodenal Ulcers.—Of 1,400 cases of peptic ulcer, 1,200 occurred on the duodenal bulb and 200 on the lesser curvature, i. e., a ratio of 1 to 6. This incidence suggested the possibility of the existence of two different diseases, despite double localization in about 10% of the cases. From the analysis of the 1,400 cases were excluded the rare cases of ulcer of the bulb in patients between the ages of 13 and 17, those with double localization, those associated with gallbladder involvement, and cases of ulcer of the pylorus. Of the 1,400 peptic ulcers, 16% were in women and 84% in men. Of the ulcers on the lesser curvature, 64.2% were in men and 35.8% in women, while 92.1% of the ulcers on the duodenal bulb were in men and 7.9% in women. All but 2.5% of the patients with duodenal ulcer (Bucquoy's disease) showed the classic course of the functional disturbance and the characteristic symptoms, thus proving that the clinical picture is remarkably fixed. However, 47.5% of the patients with ulcer on the lesser curvature (Cruveilhier's disease) had attacks of pain that were atypical in their rhythm of appearance and in their quality. This makes the clinical diagnosis of gastric ulcer more difficult than that of duodenal ulcer. The authors disagree with the classic view that postprandial pain occurs very late in duodenal ulcer and somewhat earlier in gastric ulcer. The concept that ulcer on the duodenal bulb and ulcer on the lesser curvature may be two diseases is supported by the following facts: giant duodenal ulcers are rare, but large ulcers occur quite frequently in the stomach; large gastric ulcers may disappear and cicatrize completely, while regression takes place infrequently in duodenal ulcer; patients with duodenal ulcer rarely regain their normal weight after gastrectomy, while patients with gastric ulcer do so rather rapidly. Thus gastrectomy does not seem to have the same effect on both conditions. It is suggested that ulcer on the lesser curvature may be a more "local" disease than ulcer on the duodenal bulb.

Proceedings of Royal Society of Medicine, London

44:263-346 (April) 1951. **Partial Index**

Advances in Study of Chemical Carcinogenesis. A. Haddow.—p. 263.
Hydrotherapy and Its Place in Modern Medicine. W. Yeoman.—p. 283.
Vulnerability of Eustachian Tube. D. F. A. Neilson.—p. 301.
Discussion on Recent Advances in EEG Diagnosis of Epilepsy. W. G. Walter and others.—p. 315.

Revista Paulista de Medicina, São Paulo

38:183-262 (March) 1951. **Partial Index**

*Surgical Treatment of Hypertension. J. Ramos, E. J. Zerbini, S. Dos Santos Carvalhal and others.—p. 183.
*Hemolytic Disease of the Newborn: Considerations of 12 Cases Treated with Exchange Transfusion. O. Mellone, C. da Silva Lacaz and O. Yahn.—p. 251.

Surgical Therapy in Arterial Hypertension.—Ramos and collaborators performed thoracolumbar sympathectomy by either Smithwick's or Grimson's technique in 56 patients with arterial hypertension. A biopsy of the kidney and of the intercostal muscle was made during operation in 31 cases. The authors describe the technique of the operations and the histopathological aspects of the renal and intercostal muscular lesions encountered. They believe that the operation is indicated whenever the clinical treatment of hypertension fails and in cases of hypertensive heart disease with cardiac insufficiency. The patients of this report were followed for three months to three years after sympathectomy. Three of 56 patients died within the first month after the operation (operative mortality rate, 5.3%). Immediate satisfactory results on blood pressure and the subjective and objective clinical symptoms were obtained in 50% of the cases. The roentgenologic and electrocardiographic evidence of left ventricular hypertrophy disappeared. However, in half of these patients blood pressure increased within one or two years to near or above preoperative figures, and the electrocardiographic changes reappeared. In six patients with hypertensive cardiac disease with cardiac insufficiency, good cardiac compensation was obtained, which was maintained for more than two and a half years. The good results of sympathectomy in arterial hypertension are probably due to the effect of the operation in lowering the vascular lability of the patients. The operation is of value mainly because it temporarily suppresses the subjective and objective symptoms of the disease and prolongs comfortable life of the patients.

Hemolytic Disease of the Newborn.—The authors report the results obtained in 12 newborn infants who had exchange transfusion therapy for hemolytic disease due to maternal-fetal Rh incompatibility. Sensitization of the mother to the Rh factor was due to multiparity in five cases and to the administration of Rh-positive blood transfusion to the mother in previous pregnancies in four cases. Good results were obtained in eight cases in which exchange transfusion was performed early. One thousand cubic centimeters of blood were injected and 900 cc. were withdrawn. Four patients died because of delayed treatment.

Semaine des Hôpitaux de Paris

27:1321-1374 (April 26) 1951. **Partial Index**

*Early and Late Congenital Syphilis: Study of Its Treatment. R. Debré, M. Lamy, P. Mozziconacci and J. Labesse.—p. 1321.
Anatomicoclinical Study of Bronchial Embolism in Nursing Infants. R. Debré, R. Grumbach and J. Caron.—p. 1337.
Periosteal Dysplasia or Porak and Durant's Disease. R. Debré, P. Mozziconacci, R. Grumbach and C. Attal.—p. 1345.

Treatment of Congenital Syphilis.—Of 4,055 nursing infants admitted to the Children's Hospital from January, 1941, to July, 1950, only 32 had congenital syphilis, indicating the rarity of the disease. This report covers 104 cases of congenital syphilis, 63 in children less than 1 yr. old, 13 in children between 1 and 2 yr., and 28 in children between 2 and 14. Twenty-five children died, 23 of them less than one year old. The disease is severe in younger infants because of the resultant debility and the high incidence of secondary infections. The authors believe that congenital syphilis may be prevented in 75% of the cases, provided that routine serologic tests are done during pregnancy and at least immediately before delivery and penicillin treatment practiced properly in mothers with a positive reaction to prenatal tests. Complete clinical recovery resulted from treatment with penicillin in 30 infants aged less than 2 yr. who were followed for four years, since not one of them had late secondary or tertiary syphilis. Seven of 24 infants treated with arsenic and heavy metals before the age of 2 yr. had clinical relapses, with hemiplegia in two. Treatment with arsenic and heavy metals is nearly always inadequately practiced. The only inconvenience associated with the use of penicillin is the Herxheimer reaction, which cannot yet be prevented. Only three children between the ages of 2 and 14 were treated with penicillin; the results obtained with the antibiotic were no better than those obtained with other antisyphilitic treatment. After a follow-up of five years positive serologic reactions had turned negative in only one case. Hospitalized nursing infants with congenital syphilis should be treated for 15 days with daily doses of about 10,000 units of penicillin G per kilogram of body weight, administered in three-hour injections. A vehicle that delays absorption of the antibiotic may be preferred for ambulatory treatment. The extremely low dose of 1 unit of penicillin per kilogram of body weight is recommended as the daily dose for the first three days of treatment in nursing infants with severe diffuse, congenital syphilis in an attempt to prevent the Herxheimer reaction. Treatment with 1,000,000 units of penicillin daily for 15 days is adequate for cure of cutaneous and osseous manifestations in older children. It should be combined with fever therapy in neurosyphilis.

Zentralblatt für Chirurgie, Leipzig

76:497-576 (No. 8) 1951. **Partial Index**

*Blockage of Cervical Sympathetic for Treatment of Sequelae of Cerebral Concussion. C. Blumensaat.—p. 498.
Postoperative Hypochloremia. M. Praetorius.—p. 504.
Management of Injury of Common Bile Duct During Gastric Resection by Implantation of Duct into Neck of Gallbladder and Production of Cholecystenterostomy. U. Schumann.—p. 509.
Treatment of Transplantation Flaps with Hypertonic Solutions of Sodium Chloride. J. G. J. Metzner.—p. 521.
Retroperitoneal Infection Following Anesthesia of Lumbar Sympathetic. H. Gieseking.—p. 528.
Aspects of Epidermoids of Cervical Canal. A. Hofmann.—p. 531.
Intervertebral Calcinosis. G. Ostapowicz.—p. 536.
Treatment of Acute Humeroscapular Periarthritis and Its Sequelae. W. Schmitt.—p. 540.
*Injuries with Loss of Finger Tips: Repair and Results. F. Lengemann. —p. 551.

Cervical Sympathetic Block in Cerebral Concussion.—Blocking of the cervical sympathetic chain by procaine hydrochloride is a truly causal therapeutic method, because it promptly counteracts the spasm of the cerebral vessels, greatly reduces the tendency to further spasms, and, by producing hyperemia, prevents cerebral edema or facilitates the resorption of existing edema. The pathological process in cerebral concussion is usually at first purely spastic and therefore reversible, and treatment should be performed during this stage before the process has become irreversible and before cerebral vasomotor irritability has developed, which sometimes causes belated headaches and dizziness. The author refutes the charge that cervical sympathetic block is dangerous, pointing out that he and his collaborators encountered no unavoidable serious complications in over 500 blocks. Hypersensitivity to procaine hydrochloride is possible, but this causes only minor disturbances. Strict adherence to an exact technique of injection will prevent complications. The author does not agree with those who wish to replace cervical sympathetic block with stellate ganglion block, since the technique of the latter is more difficult and dangerous and the effect of the cervical sympathetic block is more extensive. He is not, however, completely opposed to blocking of the stellate ganglion but uses it only when there is involvement of the upper extremities and thoracic organs. Block of the cervical sympathetic should be performed with the patient either sitting or on his side. The needle is introduced at the posterior edge of the sternocleidomastoid at the level of the fifth or sixth cervical vertebra. The head should be turned toward the healthy side; turning the face toward the opposite side can be dangerous. In 67 of 103 cases a single block was done, and in the remaining 36 cases it had to be repeated once or twice.

Injuries with Loss of Finger Tips: Repair and Results.—Lengemann reviews observations on 60 persons who sustained injuries causing loss of finger tips. He shows that conservative methods are adequate only when tissue loss is slight and the end of the phalanx is covered by an adequate layer of tissue. If the terminal phalanx or the stump lies open, plastic repair is advisable. The author mentions various methods that are available for this purpose and says that he obtained the best results with a sliding graft described by the Lahey Clinic in 1945.

BOOK REVIEWS

The Kidney: Structure and Function in Health and Disease. By Homer W. Smith, A.B., Sc.D., M.S., Professor of Physiology, New York University College of Medicine, New York. Cloth. $12.50. Pp. 1049, with 153 illustrations. Oxford University Press, 114 Fifth Ave., New York 11, 1951.

The plethora of current medical publications tends to obscure the fact that there are published occasionally volumes of superlative merit, literally modern medical classics. Such a volume is this extraordinary monograph on renal physiology, in which both the regulatory and excretory functions of the kidney are considered in painstaking detail. It is difficult to imagine any pertinent fact that has been omitted. Only an investigator with a lifetime of research in renal physiology could successfully undertake so monumental a task; no living physiologist is better equipped than is Homer Smith.

This volume is no book for the casual professional reader, nor is it intended for the pragmatic clinician who desires bedside rules of thumb. Indeed, in the preface, the author warns that current methods of study of renal physiology may be too elaborate for general clinical application. It is, rather, a comprehensive dissertation of renal function, as far as current knowledge makes possible, for the investigator, the teacher, and the advanced student of renal physiology.

Following the brief historical introduction, the text is divided into four sections. Part I contains chapters on renal anatomy and, in considerable detail, the methods of measuring renal function, particularly the clearance methods, by which our present understanding of function has been attained. Part II includes chapters on the antidiuretic hormone and the excretion of water, the excretion of sodium and other strong electrolytes, the adrenal cortex and Addison's disease, and acid-base equilibrium in plasma and urine. Part III consists of chapters on the control of the renal circulation and the action of pharmacodynamic agents, trophic and other factors related to renal function, renal function in infancy and childhood, the comparative physiology of the kidney, and renal hemodynamics. The final section is devoted to the alterations of renal physiology that occur in disease. It is introduced by a discussion of the limitations of the clearance methods during disturbed renal function. Disturbances of renal function are then discussed under the following headings: primary disturbances of salt and water balance, altered function in nonrenal disease, chronic congestive heart failure, essential hypertension, and acute renal failure related to toxic and traumatic injuries. Additional chapters on the juxtamedullary circulation, diseases of the kidney and urinary tract, and diuretics complete the section.

The illustrations are for the most part charts and graphs demonstrating data obtained experimentally. The comprehensive bibliography contains no less than 2,300 entries referred to in the text.

This volume, while it can be read profitably in a series of sittings, is primarily a reference work covering all phases of renal physiology. The details of experimental findings tend to become monotonous despite the author's careful subdivision of the text. Such a criticism might not be held by one who is concerned exclusively with the experimental approach. The volume does not compete with Addis's "Glomerular Nephritis," with Oliver's "Architecture of the Kidney," or with Bell's "Renal Diseases." Rather, it belongs on the reference shelf by the side of these volumes.

An Introduction to Universal Serologic Reaction in Health and Disease. By Reuben L. Kahn, D.Sc. Cloth. $3.50. Pp. 159, with 113 illustrations. Commonwealth Fund, 41 E. 57th St., New York 22; Oxford University Press, Amen House, Warwick Sq., London, E.C.4, 1951.

In this monograph Dr. Kahn gives an account about his investigations on serologic reactions with lipid antigen. It is an important collaborative study originated as an attempt to prove "that the reaction between tissue extract antigen and serum might not be primarily a syphilis reaction." It is based on "an inherent biologic tendency for serum to react with antigen—a tendency which is unrelated to syphilis." By using a multiple quantitative precipitation system each of a different sodium chloride concentration, Dr. Kahn found that all human beings and many animals give positive precipitation reactions "differentiated from one another by serologic patterns which are based on the degree and arrangement of precipitation" in the various reacting zones. Therefore, the term "universal serologic reaction" appears justified. Various diseases other than syphilis (tuberculosis, yaws, leprosy, malaria) showed definite changes in serologic patterns.

The volume is clearly written by a distinguished author of high reputation. Its purpose is not to present the principles and technics of serology applied to the diagnosis of syphilis, but to inspire the study of "universal serologic reaction" in various diseases. The lucid exposition of the complex subject is to be commended.

Clinical Heart Disease. By Samuel A. Levine, M.D., F.A.C.P., Clinical Professor of Medicine, Harvard Medical School, Boston. Fourth edition. Cloth. $7.75. Pp. 556, with 192 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W.C.2, 1951.

As in the earlier editions, the new volume has for its purpose the presentation in a simple form of the important aspects of the diagnosis, prognosis, and treatment of heart disease. Despite its modest claim there is much of value and interest for the cardiologist as well as the general practitioner. The need for the new edition is more than justified by the rapid and dramatic advances in the diagnosis and treatment of heart disease. Within recent years the field of cardiology has been broadened by the introduction of new methods of investigation, such as catheterization of the heart, and by studies in unipolar and precordial leads in electrocardiography. The therapeutic possibilities in the treatment, particularly of congenital heart disease, have been enlarged by introduction of a number of surgical interventions. Previously, the mortality rate for bacterial endocarditis was 100%; use of antibiotics now effects cure in 75% of cases. The discussion is authoritative, lucid, and adequate. Much new material brings it up to date. This is particularly true of the discussion of the subject of electrocardiography. The volume is a valuable contribution to the subject of cardiology.

Problems of Infancy and Childhood: Transactions of the Fourth Conference, March 6-7, 1950, New York, N. Y. Edited by Milton J. E. Senn, M.D. Cloth. $2.50. Pp. 181. Josiah Macy, Jr. Foundation, 565 Park Ave., New York 21, 1951.

This book provides a verbatim transcript of three papers dealing with the development of behavior patterns and of personality, along with the attendant discussion. The titles and authors of the papers are "Cultural Determination of Parental Attitudes: the Relationship Between the Social Structure, Particularly Family Structure and Parental Behavior," by George Peter Murdoch and John W. M. Whiting; "A Consideration of Some Problems in the Ontogeny of Family Life and Social Adjustments in Various Infra-Human Animals," by T. C. Schneirla, and "Working Toward Healthy Personality," by Laurence K. Frank. The essayists and those who participated in the discussion are highly skilled experts from the fields of the social sciences and the medical specialties. Although each paper might be considered independently from the others, for the purpose of this review the substance of the conference may be considered best as a whole.

Personality was considered to relate to various factors: biologic factors (based on inheritance and the physiologic status at birth); training and example (principally from the mother and other close associates, its nature determined by their cultural backgrounds); sibling rivalries, and discrimination and prejudice from associates. Through anthropologic studies, comment was made pertaining to the manner in which commonplace events may modify behavior patterns either favorably or unfavorably:

The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

these include the course of breast feeding, weaning techniques, toilet training, aggression control, development of independence, and sex training. These elements of care were compared under different types of social organization and of family unit. From animal behavior studies, evidence was offered with respect to the modifiability of what usually are termed "instinctive" behavior patterns through the imposition of external forces.

The need for general concern pertaining to the promotion of mental hygiene was emphasized as a proper corollary to efforts in preventive medicine and pediatrics. Those working with children should learn to identify the major threats and hazards to the emerging personality and detect those persons who are especially susceptible to environmental handicaps. The inefficacy of fear or a sense of guilt as motivators for desirable child behavior was stressed. It is important to give the young child a sense of confidence in his own abilities as a basis for his emotional security. One must help him develop a favorable self-image; if he can have self-approbation, it will favor a desirable pattern of response. There are periods that are especially critical in the determination of personality attributes: these are periods of stress, such as the time of weaning, of toilet training, of starting school, and of other breaks from the immediate family circle, and the appearance of puberty. Such breaks with the past patterns permit reorientation, and at such times favorable changes can be brought about through proper motivation. The more prompt the relief from unfavorable environmental patterns, however, the better the outlook for the achievement of an acceptable personality. There are preferred techniques to employ at each period of the child's unfolding personality if one is to incur the least risk of damage or distortion, or of permanent, persistent infantilism.

This small volume contains much valuable food for thought for all who deal directly or indirectly with the child. The material is well written, and the typography is excellent. It is recommended especially for the pediatrician, the obstetrician, and the psychiatrist; it should be of equal value to the general practitioner of medicine.

Introduction to Statistical Analysis. By Wilfrid J. Dixon, Associate Professor of Mathematics, University of Oregon, Eugene, and Frank J. Massey, Jr., Assistant Professor of Mathematics, University of Oregon. Cloth. $4.50. Pp. 370, with illustrations. McGraw-Hill Book Company, Inc., 330 W. 42d St., New York 18; Aldwych House, Aldwych, London, W.C.2, 1951.

This book is an introduction to statistical analysis in a rather unusual way. Most introductions take up the simpler subjects, while this text stresses tests of significance, the more advanced aspect of statistics. It is an introduction in the sense that it is a summary of statistical method and a description of the material that would be obtained from a complete discussion of the subject. The book presents all the common statistical tests of significance and the associated confidence limits. It omits algebraic proof in all cases. Empirical checks on sampling distributions are described and illustrated, and they constitute what the authors choose to call statistical proof. The book provides excellent illustrations of these significance tests and should be very useful as a reference source for the research worker. Their illustrations are chosen from a variety of fields, and they state explicitly that general statistical methods should be applicable equally in most fields of research.

The reader should be warned that the authors use one rather uncommon approach. They give extreme emphasis to the concept of degrees of freedom even apart from the problems of sampling. This can be most easily understood by an example. On page 20 the authors define variance as the sum of the squares of the deviations of the observations from the mean divided by one less than the total number of observations. This is easily recognized as an estimate of population variance obtained from the sample. It is highly irregular to call it the variance of the sample. It is regrettable that the authors choose to do so in conflict with almost all recognized usage. This causes considerable difficulty in later description. For example, on page 39 they are forced to give an excuse for a variance calculation when the denominator is N, the entire number in the universe. This would not have arisen if they had defined variance in the usual way and had restricted the division by the number of degrees of freedom to the standard terminology "estimate of population variance." This confusion also led them astray in their discussion of regression in Chapter 11. The line fitted by least squares must be obtained without the use of degrees of freedom if the sum of the squares of the vertical deviations is to be minimized. In this instance the numerical description which they give on pages 155 and 156 is incorrect in the denominators, and the nonmathematical reader will be badly confused if this text is used in conjunction with the standard textbooks on statistics.

Aside from this difficulty, this book is well written and is a valuable addition to the library of any research worker. It is regrettable that the authors choose to confuse the reader by defining estimates of population parameters as being the parameters themselves when discussing them in respect to a sample drawn from the population.

Remington's Practice of Pharmacy: A Treatise on the Preparing, Standardizing, and Dispensing of Official, Unofficial, and Extemporaneous Pharmaceutical Products, with Descriptions of Medicinal Substances, Their Properties, Uses and Doses. Also a Guide to Other Professional Services Rendered by the Pharmacist in Connection with Community Health. Intended for the Use of Pharmacists and Physicians and as a Textbook for Students. By E. Fullerton Cook, P.D., Ph.M., D.Sc., Chairman of Committee of Revision of Pharmacopeia of United States of America from 1920 to 1950, Philadelphia, and Eric W. Martin, Ph.C., B.Sc., Ph.D., Associate Director of LaWall and Harrisson, Philadelphia. With collaboration of more than ninety associates. Tenth edition. Cloth. $16. Pp. 1616, with 802 illustrations. Mack Publishing Company, 20th and Northampton Sts., Easton, Pa., 1951.

The periodical appearance of this useful book is always of great interest to practicing physicians, pharmacists, and members of the allied professions. First edited in 1885 by Joseph Price Remington primarily as a handbook for students of pharmacy, it has kept pace in its successive editions with the kindred sciences of medicine, chemistry, and pharmacy. The present edition is almost of encyclopedic proportions.

The text has been divided by the editors into fifteen distinct parts, including a history of pharmacy and a chapter on research in pharmacy. As in previous volumes, one part of the text is devoted to the various official and important unofficial preparations in commonest use. Various classes of drugs are reviewed in separate chapters; thus included are chapters on vitamins, hormones, amino acids, enzymes, sulfonamides, and antibiotics, as well as certain portions of the texts of "United States Pharmacopeia" (fourteenth edition), "National Formulary" (ninth edition), and "New and Nonofficial Remedies—1950."

The inclusion of statements indicating the therapeutic actions and doses of drugs, a novel feature of the ninth edition, has been carried over into the present volume. A comprehensive index makes for ready reference and adds materially to the usefulness of the book. This edition is a complete refresher course for pharmacists and contains much of value to the physician.

Perception: An Approach to Personality. By Robert R. Blake, Associate Professor of Psychology, University of Texas, Austin, and Glenn V. Ramsey, Professor of Psychology, University of Texas, in collaboration with Frank A. Beach, and others. Cloth. $6. Pp. 442, with 39 illustrations. The Ronald Press Company, 15 E. 26th St., New York 10, 1951.

This book is comprised of 13 papers which were delivered at the 1949-1950 Clinical Psychology Symposium held at the University of Texas. The symposium received financial support from a grant awarded by the National Institute of Mental Health of the United States Public Health Service. The book is intended for use in upper level courses in perception, personality, and experimental and social psychology. The view presented is that study of perceptual activity can provide a basic approach to personality and interpersonal relations. In an attempt to achieve continuity and integration in this material, each author was provided with an outline of the theoretical framework of the symposium at the start of the project and was given an opportunity to familiarize himself with the contributions of other authors before making his own contribution.

After a general orientation in the perceptual approach to personality, the book discusses the physical and chemical determinants of perception, the social and developmental factors that influence perceptual activities, and the role of perceptual constructs in unconscious processes and in psychotherapy.

A comprehensive index of authors and subjects has been added as a means of quick reference to the many separate investigations cited in the book.

Physical Education: Organization and Administration. By J. B. Nash, Ph.D., Professor of Education, New York University, School of Education, New York, Francis J. Moench, Ph.D., Director of Education, Division of Health, Cortland College of Education, State University of New York, New York, and Jeannette B. Saurborn, Ph.D., Director of Physical Education, Elementary School, Bronxville, New York. Cloth. $5. Pp. 498, with 61 illustrations. *A. S. Barnes and Company, 101 5th Ave., New York 3, 1951.*

Because of the increasing interest in therapeutic exercise on the part of physicians in general, medical practitioners are showing increasing interest in physical education. Drs. Nash, Moench, and Saurborn are well qualified to discuss the organizational and administrative aspects of this subject. This new general textbook covers these phases of physical education thoroughly and authoritatively. The book is divided into eight parts: introduction, selecting objectives, setting the stage, routine administration, evaluating outcomes, elementary school program, secondary school program, and special problems.

While this basic textbook on teaching procedures in physical education will be of only secondary interest to most physicians, it will be found to be a complete and thoroughgoing dissertation concerning the development and proper conduct of teaching programs, particularly in elementary and secondary schools.

Somatic Development of Adolescent Boys: A Study of the Growth of Boys During the Second Decade of Life. By Herbert Rowell Stolz, M.D., and Lois Meek Stolz, Ph.D. Cloth. $9. Pp. 557, with illustrations. The Macmillan Company, 60 Fifth Ave., New York 11, 1951.

This volume presents observations recorded by the California Adolescent Study undertaken jointly by the Institute of Child Welfare of the University of California, and the public schools of Oakland, Calif. The purpose of the seven year research program was to present a longitudinal study of adolescents. The book includes a wealth of data on somatic and social development collected on the same persons in the course of semiannual physical examinations and by observations made in the classroom, during recreation, and in the home. Included also are a number of serial photographic records and a detailed account of one of the subjects to show how personal-social relations may bear a close relation to the timing and configuration of somatic growth patterns. Emphasis throughout the book is placed on the broader scope of the "longitudinal" studies of children as compared with the older, cross-sectional type of study. This book should be of value to pediatricians, psychologists, educators, and all others interested in child development.

Social Aspects of Illness. By Carol H. Cooley, Director of Social Service, Presbyterian Hospital, Chicago. With foreword by Edna S. Newman, M.A., R.N. Cloth. $3.25. Pp. 305. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W.C.2, 1951.

This is a book on the social work aspects of illness prepared for use in nursing education. "Social factors" in illness are defined rather broadly, including, for example, climate and environmental factors. For the most part, the book deals with emotional, economic, familial, and community factors affecting the patient and his care. The book should be valuable in giving nurses better insight into the types of problems that a social worker tries to handle and some of the methods used. It is scarcely specific enough to enable the nurse to handle such problems alone, even to the extent that might be expected of nurses with some training in the social work aspects of illness.

Personal Health and Community Hygiene. By Harold S. Diehl, M.A., M.D., Sc.D., Professor of Preventive Medicine and Public Health, University of Minnesota, *Minneapolis, and Ruth E. Boynton,* M.S., M.D., Professor of Preventive Medicine and Public Health, University of Minnesota. Second edition of Healthful Living for Nurses. Cloth. $4.50. Pp. 469, with 38 illustrations. McGraw-Hill Book Company, Inc., 330 W. 42d st., New York 18; Aldwych House, Aldwych, London, W.C.2, 1951.

This is a greatly augmented and improved as well as revised edition of the textbook first issued under this title in 1944. The authors bring to it their broad experience with healthy as well as sick persons, to produce a fully rounded, well-organized, expensively documented, and, at the same time, interestingly written textbook for nurses. The discussion suggestions that follow each chapter and the references and reading suggestions recommend the book highly to teachers in training schools for nurses. The book is well illustrated with pictographs, drawings, charts, and tables. It covers the entire scope of personal and community health, including quackery, cultism, health in school and on the job, and the role of government in public health, with a glimpse into the future. Particularly valuable are the chapters on sex life and on the diseases of advancing age. This book can be recommended without reservation as a basic textbook or as a useful reference volume.

Factors Regulating Blood Pressure: Transactions of the Fourth Conference, February 23-24, 1950, New York, N. Y. Edited by Benjamin W. Zweifach and Ephraim Shorr. Cloth. $3. Pp. 219, with 39 illustrations. *Josiah Macy, Jr. Foundation, 565 Park Ave., New York 21, 1951.*

The purpose of the book is to present in only slightly edited form the presentations and discussion of a small group of very competent students of blood pressure. The coverage is broad and includes such topics as anatomical considerations, clinical criteria for diagnosis, renal changes, relationship of adrenal glands, arteritis of dietary origin, vasoexcitor and depressor materials, treatment of experimental renal hypertension with renin, purification of angiotonin, and measurement of the renin content of kidneys.

The beginner in the field would be completely baffled by the contradictions and inadequacies in logic that characterize all such informal conferences. Those more skilled in the topic and familiar with the personalities involved will find this volume a delight and heartily to be recommended, as are the three precedent companion volumes. They represent science in the raw before winnowing and logical rearrangement have changed its color and texture. Whether this is good or bad depends on one's taste for raw meat and one's ability to digest it.

The material is too varied and uneven for specific criticism. Only one point in editing must be noted in the hope that it can be corrected before it is too late. This is the repeated use of terms such as Goldblatt animals, Schroeder syndrome, Van Slyke-Phillip dogs, Goldblatt mechanisms, and other such noninforming eponyms. The book is well printed, cheap and altogether desirable if a blow by blow description of the changing scene of research is wanted.

El lactante vomitador (visto por el cirujano): Estudio crítico, diagnóstico etiológico, tratamiento consecuente. Por Emilio Roviralta, *cirujano* ortopédico y de los niños de los Institutos policlínico y neurológico de Barcelona. Cloth. Pp. 299, with 75 illustrations. José Janés, editor, Muntaner, 316, Barcelona, 1950.

The clinical aspects of vomiting of suckling babies is the subject of a thorough analysis of this interesting monograph. The author exhausts every phase of this clinical entity and discusses fallacious concepts of the subject matter. He presents a clear-cut plan for the study of the subject. The work is of value to the general practitioner, the surgeon, and the pediatrician. The book is divided into 24 chapters, in which every phase of the condition is lucidly entered into and thoroughly described, and will act as a guide to the reader, outlining the etiology, symptomatology, and therapy clearly and comprehensively. The radiologic examinations in these conditions, which frequently lead to diagnostic errors, form an outstanding chapter, which is ably presented. The book is of particular value in differential diagnosis. A comprehensive index concludes the work. Those reading Spanish and those who are interested in the subject will find it of value.

Tratamiento quirúrgico de las varices esenciales. Por Víctor Salleras y Ramón Brull. Prólogo del Prof. J. Puig Sureda. Cloth. Pp. 250, with 118 illustrations. José Janés, editor, Muntaner, 316, Barcelona, 1950.

This monograph is an excellent, up-to-date presentation of the subject. The first part deals with the history of the development of the surgical procedures to treat the principal forms of varicosities.

The book is divided into 12 chapters: history, etiology, diagnosis and indications; treatment; surgery; combined treatment; anatomical aspects; surgical technique; postoperative complications; essential complications; varicose ulcers, and varicophlebitis and recurrent varices. Every aspect of the subject matter is discussed. Photographs, charts, line drawings, and excellent radiographs augment the text. For those who read Spanish, the book will prove of value. Particularly since the knowledge of varicosities and their complications have recently given an impetus for study and great advances have been recorded, this book should be instructive.

QUERIES AND MINOR NOTES

SPINAL PUNCTURES AND HEAD INJURIES

To the Editor:—*What is the opinion regarding the routine use of spinal tap, with or without manometer readings, in all cases of head injuries regardless of other findings?*

Philip Von Hunger, M.D., Escalon, Calif.

Answer.—Any condition that varies as widely as do the clinical manifestations of injuries to the head cannot be treated in routine fashion. It is as ridiculous to state that one should routinely use spinal punctures in case of injuries to the head as it is to state that one should never use them. There are times when spinal punctures like many other procedures can be of value, both diagnostically and therapeutically, in cases of this type. There are various situations in which one would decide to make a spinal puncture, and one would particularly do so in considering the diagnosis of infectious meningitis, to relieve the symptoms of a traumatic subarachnoid hemorrhage or to measure the pressure of the cerebrospinal fluid. On the other hand, there are certain situations in which a spinal puncture would generally be ill advised, as in cases in which there was severely increased intracranial pressure, particularly if the pressure had persisted and had given rise to choking of the optic disks. One would not generally make a spinal puncture in cases in which there was a discharge of cerebrospinal fluid from the nose or ears, or in which there was a compound wound of the scalp with an opening into the intracranial cavity.

DRUG ADDICTION

To the Editor:—*A man, 50, has been taking about 700 mg. of meperidine hydrochloride (demerol®) and 80 mg. of methadone hydrochloride (dolophine) daily for one year. Drugs were prescribed for pain from a spinal tumor, which was removed eight weeks ago, and the pain has disappeared, but now the drug addiction is obvious. I note that the literature advises the use of methadone in treatment of morphine addiction. In this case, with the patient already taking methadone, do you think it possible or advisable to stop the meperidine, replace it with additional methadone, and then, with the patient taking only methadone, gradually reduce the methadone? I would greatly appreciate advice as to the feasibility of this plan.*

M.D., New York.

Answer.—Methadone can be substituted for meperidine in addicted persons without signs of abstinence appearing. The procedure proposed in the question would be the preferred method of withdrawal of meperidine. Probably no more than 100 mg. of methadone daily would be required. Since the patient is recovering from a long illness, reduction should be done rather slowly, and about 30 days should elapse before methadone is completely discontinued.

RETROLENTAL FIBROPLASIA IN TRIPLETS

To the Editor:—*The principal of a school for the blind has just related to me a case of triplets in all three of whom occurred retrolental fibroplasia. He feels this is the only recorded instance of this kind. Can you confirm this?*

Arthur A. Rodriquez, M.D., Chicago.

Answer.—The occurrence of retrolental fibroplasia in all three triplets has not been reported in the literature. There is, however, a relatively high incidence of retrolental fibroplasia among twins and triplets because multiple pregnancies frequently terminate prematurely and retrolental fibroplasia occurs almost exclusively among prematurely born infants. Among 421 patients with retrolental fibroplasia who have been seen at the Columbia-Presbyterian Medical Center, for example, there were 54 sets of twins (normal expectancy 4.5 sets) and seven sets of triplets (normal expectancy 0.056 sets). Among the twins only one infant survived in each of 24 sets. Of the remaining 30 sets, both infants had retrolental fibroplasia in 15 cases and only one was affected in the remaining 15. Among the seven sets of triplets all three infants survived in five cases. In two of these, two of the infants had retrolental fibroplasia and one was normal, and in three cases one was affected and two were normal. In both of the remaining two cases of triplets one infant died and the surviving infants developed retrolental fibroplasia. There is suggestive evidence that in monozygotic twin pregnancies either both or neither twin is affected, whereas in dizygotic twin pregnancies retrolental fibroplasia may develop in one twin independently of the other (Speert, H.; Blodi, F. C., and Reese, A. B.: *Am. J. Obst. & Gynec.* **59**:246, 1950).

DIET FOLLOWING GASTRECTOMY

To the Editor:—*Please advise me on the postoperative care of a gastrectomy patient, especially in regard to diet.*

Nathan Mann, M.D., Corpus Christi, Texas.

Answer.—The patient, after gastrectomy, should be kept on appropriate intravenous feeding for one or more days. Complete rest of the gastrointestinal tract for a few days after operation tends to reduce the incidence of digestive disturbances when oral intake is started. If an indwelling tube is in the stomach, the appropriate time for starting oral feeding is shown by a change from bile-stained to clear fluid, a diminution in the amount of aspirated gastric contents and absence of retention when a trial drink of 200 cc. is given with the tube clamped. Once motility is restored, the diet should be rapidly increased from simple liquids to a full diet, including milk and solid food. If the gastrectomy is done for peptic ulcer, the objective of the operation is to obviate the need for ulcer diets and the patient should therefore be so told and instructed to eat well of anything he likes (aside from rich, greasy and highly spiced foods). He should also be told that there is often a short transitional period, lasting a few days to a few weeks, during which the gastrointestinal tract becomes adjusted to the new anatomic arrangement. During this period it is usually advisable for the patient to eat small amounts frequently, particularly if but a small amount of stomach remains.

BLEEDING FROM NASOPHARYNX

To the Editor:—*A 44 year old man has had slight bleeding from the nasopharynx for two years. He has a history of hay fever. Examination of the nasopharynx discloses a brownish bloody discharge on the right side, from the region above the posterior tip of the inferior turbinate, but the site of origin cannot be seen. Other results of examination were normal except for some hypertrophy of the nasal mucosa. Two biopsies of the area of bleeding disclosed no abnormalities. Sinus x-rays were normal. What further measures should be taken in regard to diagnosis and treatment?*

M.D., Illinois.

Answer.—In the event they have not been employed during examination of the nasopharynx, the nasopharyngoscope and the pharyngoscope may well be used, especially since effective treatment depends on establishment of an accurate diagnosis. Cystic degeneration of the seromucinous glands in the nasopharynx should be considered and a cytological and chemical analysis of the bloody discharge made. The condition could be due to low grade infection of the mucosal lining of a persistent nasopharyngeal bursa, an entity known as Thornwaldt's disease, which is not infrequently accompanied by a slight amount of bleeding. Treatment of Thornwaldt's disease involves destruction of the lining mucosa of the bursa by means of a silver nitrate stick, trichloracetic acid or electrodesiccation.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

SCREENING SCHOOL CHILDREN FOR VISUAL ERRORS

To the Editor:—*Among public health personnel there is a controversy over the relative merits of the Snellen chart (for illiterates) and the Massachusetts vision-testing apparatus for screening school children for refractive errors. Is the Massachusetts vision-testing method superior, and do its advantages compensate for the extra investment of money and time necessary for its application?* *M.D., Michigan.*

Answer.—The Massachusetts vision test is an important step forward in that, in addition to the Snellen test, which screens out myopia and all other defects which impair vision (and which is an integral part of the Massachusetts vision test), it includes a simple but effective and inexpensive test for hypermetropia of + 1.75 D or over and for significant amounts of heterophoria which do not affect vision and does it in a simple and less expensive way than the tests advertised by several commercial houses.

The Snellen test alone fails to screen out a good many cases needing care. The Massachusetts and similar tests pick up many of these (as is highly desirable). They include also a moderate number of children who do not need glasses. This is unavoidable. It must be understood that the child is referred to the specialist without any diagnosis or hint given as to what the school test revealed—only that the test showed that there were grounds for suspecting that treatment was needed.

Those who are in charge must be painstakingly trained to deal with the parents so tactfully and wisely that they will feel it is a privilege of great value to have their children shown to be healthy and normal and to have this proof that the school is alert and sparing no pains to make sure that their children will not suffer from neglect. Also these parents should be made to realize that the methods of school examination, in order to detect the defective children, must inevitably subject some normal ones to the inconvenience and expense of an examination by an expert.

RHEUMATOID ARTHRITIS AND PREGNANCY

To the Editor:—*A 58 year old woman has had rheumatoid arthritis, without limitation of motion of any joint, for 38 years. Her condition has been diagnosed by many internists. She became worse during each of two pregnancies. She has had every treatment, up to the most recent, without success. I started treatment with desoxycorticosterone acetate, 5 mg. intramuscularly, and ascorbic acid, 1,000 mg. intravenously. Her pains became worse, and her temperature increased a degree for two or three days after each injection. X-rays show typical rheumatoid arthritis, but results of physical examination for arthritis are entirely normal. She has frequent bouts of arthritic pain not relieved by the usual drugs. What would you suggest?*

F. M. Logsdon, M.D., Marfa, Texas.

Answer.—Assuming that the diagnosis is correct as stated, it seems necessary, nevertheless, to indicate that the diagnosis may need to be reviewed. The inquirer states that the patient shows no limitation of motion in any joint and that results of physical examination for arthritis are entirely normal. This is certainly unusual for a patient who has had rheumatoid arthritis for 38 years. Absence of physical findings for so long suggests the possibility that the patient may have been suffering from fibrositis. If the diagnosis of rheumatoid arthritis is correct, it is necessary to comment on the statement that symptoms have been aggravated during pregnancy. In at least 85 per cent of cases the opposite effect is observed. Symptoms of rheumatoid arthritis are relieved by pregnancy. Occasionally, however, symptoms may not be notably relieved, and in rare instances aggravation of symptoms may occur in pregnancy for unknown reasons. This patient's experiences during pregnancy cannot, therefore, be used to support or refute the diagnosis as given. Experiences with desoxycorticosterone acetate in association with ascorbic acid as a treatment measure for rheumatoid arthritis have repeatedly proved unsatisfactory, and in some instances this therapy can aggravate symptoms rather than relieve them. If hormone therapy is to be undertaken for this patient, it would seem more reasonable that one use cortisone and follow dosage plans outlined in published papers (Hench, P. S.; Kendall, E. C.; Slocumb, C. H., and Polley, H. F.: Effects of Cortisone Acetate and Pituitary ACTH on Rheumatoid Arthritis, Rheumatic Fever, and Certain Other Conditions, *Arch. Int. Med.* 85:545 [April] 1950; Boland, E. W., and Headley, N. E.: Management of Rheumatoid Arthritis with Smaller (Maintenance) Doses of Cortisone Acetate, *J. A. M. A.* 144:365 [Sept. 30] 1950; Rosenberg, E. F.: Rheumatoid Arthritis Therapy with Pituitary Adrenocorticotropin, Cortisone, and Various Adrenal Steroids, *M. Clin. North America* 35:3 [Jan.] 1951).

FREQUENT URINATION IN SIBLINGS

To the Editor:—*I have observed three members of one family, two males, ages 46 and 40, and one female, aged 33, all of whom have had urgency and frequency of urination since puberty. All three have been examined, and all findings are negative for genitourinary pathology. Is it possible that in all three there is a congenital or familial psychoneurogenic bladder? No gross or apparent psychological or emotional problems have been uncovered in any of them. What would you suggest?*

L. A. Cibelli, M.D., New York.

Answer.—The incidence of urgency and frequency of urination since puberty in three members of one family without apparent etiologic organic lesions is unusual. Urinary frequency in the female may be caused by lesions that may be difficult to detect on casual clinical examination. Interstitial cystitis with little or no cystoscopic evidence, chronic urethritis with moderate pathological changes in the urethra, infection of urethral and periurethral glands, obscure urethrocele and various other lesions may be easily overlooked by urinalysis and by cystoscopic or urethroscopic examination. In the male, chronic verumontanitis with or without prostatitis and vesiculitis may cause frequent urination without evidence of infection in the urinary tract revealed by casual examination. If any of these conditions exist, dilatation of the urethra followed by local medication usually relieves the symptoms. It may be well to try such treatment empirically even if clinical evidence of organic lesions is lacking.

Patients are sometimes observed, however, who have a tendency to urinate more frequently than average in the absence of any organic lesion in the urogenital tract. It would be logical to infer that such symptoms may be of a functional type. Such persons may have hypersensitive innervation of bladder control, which causes them to respond to the slightest stimuli. This tendency has been observed in several members of the same family and could be explained best on a psychoneurogenic basis. In the absence of any specific medication for such patients, there are several antispasmodic drugs that might be tried. In some cases frequent micturition has been reduced by alkalinization of the urine. The possibility of allergy could be considered, although an uninterrupted persistence of symptoms since puberty would make it doubtful.

BROMIDE IN THE BLOOD SERUM

To the Editor:—*What is the bromide level in the blood during bromide intoxication? I can find no literature on this subject and would greatly appreciate this data.*

A. Del Giudice, M.D., Binghamton, N. Y.

Answer.—Wikoff and his colleagues (*J. Lab. & Clin. Med.* 24:427, 1939), as quoted by Kolmer (Clinical Diagnosis by Laboratory Examinations, ed. 2, New York, Appleton-Century-Crofts, Inc., 1949), reported that the normal bromide of the blood serum varies from 0.33 to 1.73 mg. per 100 cc. A blood bromide concentration of 150 mg. per cubic centimeter is considered the upper limit of safety and amounts above 150 mg. are usually accompanied by signs of intoxication. However, some patients may tolerate concentrations as high as 200 mg. per cubic centimeter. It is not uncommon to find, in patients who have been taking bromides for a long time and have bromoderma, a concentration of 75 to 100 mg. per cubic centimeter or more.

INCOMPLETE RIGHT BUNDLE BRANCH BLOCK

To the Editor:—*I examined a 6 year old boy last summer and noted a systolic murmur; other findings were negative. The heart had been normal eight months previously. There had been minor intervening illnesses of the upper respiratory type, but nothing indicating rheumatic fever. An electrocardiogram showed an incomplete right bundle branch block and no evidence of rheumatic carditis, and a recheck showed similar findings. The child has been symptom free and has had no complaints. The electrocardiogram taken four months later showed incomplete right bundle branch block with a conversion of the T waves in leads V_2 and V_3 from an inverted position to an upright position, but no evidence of rheumatic fever. An x-ray of the chest showed some suggestion of mitral disease. I would appreciate a discussion of the significance of these electrocardiographic findings.*

Norman L. Schmitt, M.D., Detroit.

Answer.—The diagnosis of incomplete right bundle branch block may be difficult. Similar changes may result from right ventricular hypertrophy. The two conditions may coexist. When the QRS is 0.09-0.11 second in duration and S_1 prominent in the standard leads, V leads should be recorded. A late R^1 in V_{1-2} following the initial small R spike usually indicates incomplete right bundle branch block. In view of the history and findings, a diagnosis of active rheumatic carditis is not justified. The conduction disturbance may be of congenital origin. An old, healed, unrecognized lesion of rheumatic or other origin could be responsible. Treatment should be expectant. Discussion of the problem with the parents should be guarded.

GASTRIC ULCER IN AN INFANT

To the Editor:—*I referred a newborn child to a pediatrician because the baby was not doing well. Nothing specific could be found, but the child did not gain and appeared pale. The pediatrician, after several weeks, gave a diagnosis of gastric ulcer. I have never seen, or read of, gastric ulcer in the newborn. Please comment.*

Herbert B. Potthoff, M.D., Winslow, Ariz.

Answer.—Gastric and duodenal ulcers were once considered rare in infancy and early childhood, but many instances were probably overlooked in the past. In one third or more of the reported cases, ulcers have been found at autopsy of infants and children dying of other causes. Ulcers in the duodenum are said to be 10 times as frequent as those occurring in the stomach, and 70 per cent of the reported cases of duodenal ulcer have been observed between the ages of 6 weeks and 5 months; 10 per cent of the duodenal ulcers occur in the newborn. Hemorrhage is the only symptom of duodenal ulcer, and the blood may be either vomited or passed in the stool.

Two reports on gastric and duodenal ulcer in infancy appeared in the December 1950 issue of the *Journal of Pediatrics:* "Bleeding Duodenal Ulcer in Infancy: A Surgical Problem," by George W. Plummer and Samuel J. Stabins, and "Perforated Gastric Ulcer in a Newborn Infant," by Lydia T. Wright and Beatrice E. Scott.

PYROGENS AND ESSENTIAL HYPERTENSION

To the Editor:—*Can you give me any information on essential hypertension with fever therapy?*

Roger C. Smith, M.D., New Haven, Ind.

Answer.—Several reports have appeared concerning the therapeutic effects of intravenous injection of bacterial pyrogens. These soluble glucosides are bacterial products which are carefully removed from fluids prepared for intravenous infusion to avoid febrile reactions. Page and Taylor, reporting in modern concepts of cardiovascular disease, used pyromen,® a soluble pyrogen marketed by Baxter Laboratories, and stated that they administered a daily intravenous injection for five to six days per week, starting with 0.5 cc. of the solution and modifying the dose until temperatures of 103 F. to 104 F. were consistently obtained. These authors state that it is important to limit the application of this method to patients with good renal function.

Essentially, the intravenous application of soluble bacterial pyrogens in the therapy of hypertensive disease is still in the stage of clinical experimentation. Fever is a violent systemic reaction, affecting the hydration of tissues, and may thus initiate undesirable as well as desirable changes in the tissues, both vascular and parenchymal. It has been reported that fever therapy caused papilledema to disappear from the retinas of patients with malignant hypertension, but this does not prove that damage may not have been done elsewhere. In the management of early benign, so-called essential, hypertension one must remember that these patients feel well, are normally vigorous and energetic and often resent the implication that they are ill. Therefore, any therapy requiring frequent injections and/or discomfort, such as a violent febrile reaction, will rarely be persisted in unless the patient is excessively apprehensive. It is most important not to add to anxiety. Thus it appears doubtful that pyrogen therapy will be a significant addition to the therapeutic armamentarium in hypertensive disease other than for the late malignant form.

INDUCED ADRENAL ATROPHY

To the Editor:—*Are there records of any carefully made postmortem studies of the pituitary and adrenals in patients with chronic rheumatoid arthritis not treated with hormones and patients treated for long periods with pituitary adrenocorticotropic hormone (ACTH) or cortisone? Will life be shortened by cortex atrophy if the patient is given replacement therapy with cortisone or by pituitary damage and premature adrenal exhaustion if pituitary adrenocorticotropic hormone is given?*

M.D., New York.

Answer.—To date, there is no evidence that the atrophy of the adrenal induced by cortisone therapy or the hyperactivity induced by pituitary adrenocorticotropic hormone results in any permanent disturbance in adrenal function after treatment has been withdrawn. Functional studies carried out by a number of investigators revealed the restoration to normal of hormonal activity following the withdrawal of these agents.

ARSENIC AND DIMERCAPROL

To the Editor:—*A 63 year old woman was admitted to the hospital claiming to have taken arsenic. She received 4.5 cc. of dimercaprol (BAL) immediately and 2.5 cc. every four hours thereafter. She died on the fifth day, after a total dosage of 36 cc. Autopsy revealed acute ulcers in the stomach and throughout the colon and degenerative changes in the liver. Toxicological studies of the brain, liver and kidneys were negative for the heavy metals, in particular, arsenic. Could the dimercaprol therapy prevent the identification of arsenic, or other poison, in the tissues?*

N. H. Stoer, M.D., Shreveport, La.

Answer.—Arsenic, had it been present in the tissues of the deceased person, would have been detected by any of the commonly employed quantitative toxicological procedures. It is not difficult to establish the presence of as little as 1 microgram per 100 Gm. of tissue by means of the relatively simple Gutzeit test, for example. The presence of dimercaprol would not affect the detection of arsenic by any procedure in which the tissues are completely destroyed by wet or dry ashing. Since arsenic was not detected postmortem, the question arises as to whether it could have been the cause of the ulceration of the gastrointestinal tract and the degenerative changes in the liver and kidneys. In the absence of further information it will be assumed that these changes were of recent origin and that the alleged ingestion of arsenic occurred shortly before admission to the hospital. Although dimercaprol may enhance the urinary excretion of arsenic in the human being, it appears unlikely that it could do so to such an extent as to prevent its chemical detection after five days, particularly if the amount of arsenic ingested were sufficient to be acutely toxic and ultimately fatal. It appears that urinary arsenic determination during hospitalization would have been an important aid in evaluation of the validity of the diagnosis and in the determination of the efficacy of the treatment.

VITAMINS

To the Editor:—*A woman has been taking a vitamin concentrate daily for several years and claims to feel better while taking it. She is in the menopause and is also taking one of the estrogens daily. Recently she developed acute pain in the back, and x-rays show osteoarthritis in the lumbar and sacral region. She has always taken about a quart of milk a day. Is this vitamin concentrate contraindicated? Would it be better to give the patient a vitamin B preparation? Hemoglobin and blood cell count are normal. The patient leads a very active life. She wears firm support for the back. I would appreciate further suggestions.* *M.D., New York.*

Answer.—There is no reason to believe that the vitamin concentrate taken by this patient is in any way related to the osteoarthritis of her spine. This type of arthritis at her time of life is extremely common, and it is probably, in the last analysis, an expression of the wear and tear of life. Whether a patient who is properly nourished and has no impairment of her alimentary tract, as is apparently true of this patient, should take a polyvitamin mixture throughout the years is questionable. The quart of milk a day is proper and should not in itself contraindicate the vitamins. Regarding the thiamine, no specific need is apparent; if the physician wishes, there would be no harm in his giving 10 mg. of thiamine hydrochloride by mouth in tablet form three times daily for a limited period, perhaps two or three months. The importance of a balanced diet should be emphasized. The patient should learn that, for the maintenance of robust health, vitamins should as a rule be obtained from the food.

ELECTRICAL POTENTIALS IN DEATH

To the Editor:—*What is the usual sequence of disappearance of electrical potentials in the dying human, e. g., brain wave activity and electrocardiographic activity? If this has not been studied in humans, has it been worked out for animals?* *M.D., Utah.*

Answer.—If death is due to failure of the heartbeat, the electrocardiographic activity disappears before the electrical activity of the cortex (electroencephalogram), but, if death is due to respiratory failure or to a gradual circulatory failure, the electroencephalographic activity usually disappears before the electrocardographic. The cortex is much more sensitive than the heart to lack of oxygen and to hypoglycemia.

Sometimes, after the heart has failed and both types of activity have entirely disappeared, recovery of the heartbeat may occur. The electrocardiogram is a sensitive indicator of such recovery. After a few heartbeats, as evidenced in the electrocardiogram, the electrical activity of the brain may revive. This can occur, however, only if the nutrition of the brain (oxygen and glucose supply) has not been impaired too seriously for too long.

Most of the information on this subject has been obtained from animal studies, but Dr. Robert Schwab, of the Massachusetts General Hospital, has studied the electrocardiographic and the electroencephalographic activity prior to and during death in a human being (The Measurement of Body Currents, *Amer. Inst. of Electrical Engineers* **60:** 1941).

TUBERCULOUS ARTHRITIS

To the Editor:—*A patient has tuberculous arthritis of the right wrist with subcutaneous abscesses. May streptomycin be given intra-arterially? What dilutions and dosages would be appropriate? Have any beneficial effects been reported from such treatment of tuberculous arthritis?* *S. D. Austin, M.D., Clarksdale, Miss.*

Answer.—Streptomycin apparently has not been used intra-arterially, and it would be most difficult to continue such a method of administration. The ordinary intramuscular method will answer the purpose. The dosage should be about 1 Gm. a day for 60 to 90 days, or longer if the wound is still unhealed but continues to progress favorably. Damage to the eighth nerve may be suspected if any vertigo or similar symptoms appear.

Administration of 12 Gm. of paraaminosalicylic acid daily would be much more rational, and the streptomycin doses should be spaced further apart. It is common practice now to give two doses a week of streptomycin, and daily doses of paraaminosalicylic acid. The paraaminosalicylic acid is given four times a day, in water, near meal time, so as to protect against the irritant action on the stomach. It is better to give the sodium salt, which is available at all the large drug houses. Many authorities prescribe dihydrostreptomycin instead of streptomycin. This drug seems to be slightly less neurotoxic, and dosage up to 1.5 Gm. a day may be given. While the streptomycin and dihydrostreptomycin are usually given in intervals ranging from 45 to 90 days, paraaminosalicylic acid may be continued for several months if improvement continues.

SMALL GENITALIA

To the Editor:—*A 30 year old man, in good health, weight 155 pounds (70 Kg.) and 5 feet 10 inches (178 cm.), is apparently normal except for the size of his genitalia. His penis in erection is about 4½ inches (11.4 cm.) long and about 4½ inches (10.75 cm.) in circumference. His testicles and scrotum are small. Orgasm in intercourse takes an unduly long time. I gave him a seven week course of A. P. L.® (chorionic gonadotropin preparation), 500 to 750 units, three times weekly. No noticeable change took place. I then followed with intramuscular injections of testosterone propionate, 25 to 37.5 mg. three times weekly for six weeks, and no change in sex organs has taken place. His basal metabolic rate, ascertained before these treatments were begun, is —5. Kindly advise the therapy indicated.* *M.D., New York.*

Answer.—If the sexual organs of this man were atrophic because of a deficiency of male hormone, substitution therapy with testosterone would restore the organs to their normal size. Since this patient had no response from adequate replacement therapy, it can be deduced that the size of his sexual organs are normal from an endocrine standpoint, and no further growth can be obtained beyond this stage. The small size of the genitalia is apparently a genetic characteristic, and any distress he may have because of this should be corrected as much as possible by reassurance and elimination of doubts as to his sexual potency.

SHAVING THE SCALP

To the Editor:—*Is there any scientific truth to the repeated observation that shaving the scalp causes hair to curl? Shaving the scalp is usually recommended after recovery from an acute infectious disease. If the hair curls, is it due to the fever, or to the shaving, or is it another fallacy?* *M.D., Indiana.*

Answer.—There is no scientific evidence to support the contention that shaving the scalp causes the hair to curl. It is also rumored, but not confirmed by controlled observations, that roentgen epilation of the scalp will result in the hair's being curly when it grows back. There is no scientific support for the belief that shaving the scalp or prolonged fever will produce curly hair.

MAINTAINING COLLAPSE IN TUBERCULOUS CASES

To the Editor:—*Mineral oil has been used extensively as oleothorax to maintain a permanent or semipermanent collapse in tuberculous cases. Is there any evidence that mineral oil as used in these cases predisposes to malignant change?* *M.D., Missouri.*

Answer.—There is no evidence that liquid petrolatum (mineral oil) predisposes to cancer when used to maintain a semipermanent collapse of the lung in tuberculosis. Occasionally there will be a foreign body reaction on the tissue surface approximating the oil, but nothing more serious than this has been reported. To obviate any possibility of cancer due to coal tar products, one might use poppy seed oil, which is less irritating.

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PRINCIPLES FOR IMPROVING PATIENT CARE IN THE HOSPITAL LABOR AND DELIVERY SUITE

Edwin M. Gold, M.D., Jere B. Faison, M.D., Helen M. Wallace, M.D.
and
Margaret A. Losty, R.N., New York

If one views the picture of maternity care broadly, there are two areas that are of greatest importance to the life of the expectant mother and the fetus: (1) the antepartum period and (2) the period during labor and delivery. A blueprint for antepartum care has already been briefly described.[1] This report will describe many of the essential features of care during labor and delivery that are necessary to protect the life and promote the well-being of the expectant mother, the fetus, and the newborn. These features are described as a result of surveys of the 106 hospitals in New York City having maternity and newborn services. The surveys were conducted by members of consultant survey teams of the maternity and newborn division of the New York City Department of Health.

OBSTETRIC SUPERVISION

It would be expected that the maternity service, of which the labor and delivery suite is part, should be under the direct medical supervision of a qualified obstetrician. Such an obstetric director should be responsible for the establishment of the technical obstetric policies and procedures for the care of patients during labor and delivery. Daily rounds would be made by the director, or by an obstetrician or staff of obstetricians, to provide the necessary supervision so that the established policies and procedures would be well carried out.

Of major import to the expectant mother and her fetus are policies regarding the indications that warrant consultation with a qualified obstetrician. Such consultation indications usually include the following: major obstetric operative procedures; forceps delivery other than outlet forceps; serious obstetric or medical complications, such as toxemia, bleeding, cardiac disease, premature labor, diabetes, and the like; breech presentation, and labor of more than 24 hr. in primiparous patients. The question of the need of consultation for multiparous patients with breech presentation is in the process of being studied.

In addition to adequate obstetric supervision at the attending staff level, there should be adequate obstetric house staff coverage, which serves two functions: (1) the training of interns and residents in obstetrics and (2) the provision of continuous medical supervision of the patient during labor and delivery. Ideally, every maternity service should be of such caliber as to be approved for the training of interns and residents in the specialty and therefore should be of the type that will ensure eligibility for the American Board of Obstetrics and Gynecology for house staff members who participate in the full residency system of training. Since the great bulk of obstetrics throughout the country is performed by physicians in general practice, there should also be adequate opportunity for the training of these future practitioners. Delineation of functions of the attending, resident, and intern staff is necessary if there is to be adequate protection for the patient in labor and during delivery.

It is desirable that the physicians who give antepartum care to patients in the hospital's antepartum clinic be members of the hospital's inpatient staff so that there will be continuity of medical care of the patient.

ANESTHESIA SERVICE

It is a curious dichotomy in the pattern of medical practice that there is a discrepancy in the quality of anesthesia service for the surgical operating room and for the delivery suite. In these hospitals that have well-organized anesthesia departments, it is not uncommon to find anesthesia service being rendered to surgical patients by well-trained and qualified physician and nurse anesthetists; in contrast, the anesthesia service for

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From the Maternity and Newborn Division, New York City Department of Health.

A qualified obstetrician is herein described as one who holds any one or combination of the following ranks: (1) specialist certified by the American Board of Obstetrics and Gynecology, (2) fellow of the American College of Surgeons (in the specialty of obstetrics and gynecology), and (3) associate attending obstetrician or higher at a voluntary or municipal hospital.

[1] Gold, E. M.; Wallace, H. M., and Losty, M. A.: A Blueprint for Changing Concepts of Antepartum Care, Am. J. Pub. Health 40: 792-797 (July) 1950.

the delivery suite is usually of a "pick-up" nature—anyone may render such anesthesia. This survey finding is reflected in the fact that in New York City anesthesia has now emerged as one of the major causes of maternal mortality, being outranked only by hemorrhage, infection, heart disease, and toxemia.[2] This dichotomy becomes even more marked when it is realized that there are usually at least two lives at risk in the delivery room (mother and fetus), while only one life is at risk in the surgical operating room.

It follows then that each hospital having maternity service should have available at all times a well-organized anesthesia department, part of whose functions is the provision of anesthesia service to those obstetric patients who are to receive it. Either well-trained and qualified physician or nurse anesthetists may be used. Such personnel will also play a major role in the determination of feeding policies during labor and of resuscitation of the newborn.

NURSING STAFF

It is generally agreed that the nursing care of the patient in labor and during delivery is one of the strategic areas of patient care in any hospital. Just as there is a qualified obstetrician responsible for the medical supervision of patients in labor and delivery, so too there should be a well-qualified nurse in charge of the labor and delivery suite. Such a member of the nursing staff should have had advanced preparation in the field of maternity nursing and should be directly responsible to the nursing supervisor of the maternity service. There should be a staff of registered professional nurses for each tour of duty in sufficient numbers to provide or supervise good patient care. The number will depend on the size of the maternity service and the number of deliveries to be done.

There have been no studies undertaken to indicate what sized nursing staff is necessary for patients in labor and during delivery nor any studies to indicate the proper proportion between the nursing staff at the registered professional nurse level and the nursing staff at the level of practical nurses, aides, attendants, and the like. It is, however, generally agreed that labor patients, particularly those who receive analgesia, should not at any time be left unattended. It is likewise agreed that there should be one member of the nursing staff, and preferably two, functioning in the delivery room during a delivery. If the labor and delivery suite has a recovery room, an adequate nursing staff must be provided in this area if the purpose for which the recovery room is intended is to be served.[3]

The personnel of the labor and delivery suite will depend to a certain extent on whether there is a central supply room in the hospital, or whether the making and sterilization of supplies for labor and delivery are done in the delivery room suite itself. The former arrangement is more efficient and economical. The latter requires additional nursing supervisory and auxiliary personnel, as well as space in the labor and delivery suite, and furthermore requires so careful a definition of duties in this area, that the time of the registered professional nurse, who is essential for good patient care, is not spent in washing gloves, making supplies, and the like. Such duties constitute a waste of skill and training.

PHYSICAL SETUP

The physical setup of a labor and delivery suite may be functionally divided into the following areas: (1) areas of patient care, including admission room, labor room, delivery rooms, and recovery room; (2) areas for staff functions, including physicians' dressing room, nurses' dressing room, office of the obstetric director, office of the nurse in charge, office for the anesthetist, chart room or area, and scrub-up, and (3) accessory facilities, including obstetric cleanup, nurses' workroom, sterilization room (if a central supply room is not provided), laboratory, storage, and utility room.

AREAS OF PATIENT CARE

Admission Room.—It is essential that the labor unit contain an admission room, where the new labor patient may be received into the unit, and where the admission history and physical examination may be performed. Here too the patient may be bathed and prepared for labor and delivery.

Labor Rooms.—The number of labor rooms and delivery rooms will depend on the number of maternity reservations made for a given period and on the amount of patient turnover in the maternity service. A practical index to use is the provision of one labor bed for each 10 postpartum beds. In order to provide patient privacy, each labor patient should be in a separate room. Each single room should have a minimum of 80 sq. ft. of floor space and have hot and cold running water equipped with arm, foot, or knee control, sphygmomanometer, stethoscope and the like. All equipment for the patient, such as a thermometer and bedpan, should be at the bedside. All labor beds should be equipped with sideboards to protect the patient.

Delivery Rooms.—A practical index to use in the planning of delivery rooms is one delivery room for every 20 postpartum beds. A minimum of two delivery rooms is essential in any service, for there are occasions when it is necessary to conduct more than one delivery at a time. At no time should there be two deliveries conducted in the same room at the same time. Each delivery room should be provided with adequate supplies and equipment for the protection of the life of the mother and her newborn infant, including an anesthesia machine, delivery instruments, medications, a cutdown set, a supply of plasma and intravenous fluids, a modern thermostatically controlled incubator or heated crib that should be kept warm at all times, resuscitation equipment for the newborn infant, identification equipment, and oxygen. Obviously, there must be personnel at each delivery well versed in the art of resuscitation of the newborn infant. It is desirable that a small amount of blood, both Rh positive and Rh negative of all four types, be kept in the delivery suite for emergency use, since hemorrhage is the major cause of maternal mortality in New York City at present. Adequate lighting is essential, as well as provisions for the prevention of electrostatic hazards.[4] Many hospital authorities consider it desirable to soundproof and air-condition the labor rooms and the delivery rooms. If cesarean sections are to be performed in the delivery suite, one delivery room should be completely equipped as an operating room. If, on the other hand, cesarean sections are performed in an operating room, the operating room should be equipped to receive and give immediate care to the newborn infant.

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[2] Gold, E. M., and Wallace, H. M.: A Study of Maternal Deaths in New York City for 1947, New York State J. Med. 49: 1676-1680 (July 15) 1949.

[3] McLean, L. F.; McDowell, H. C., and Sadugor, M. S.: The Use of the Recovery Room in Lowering Meternal Mortality, New York State J. Med. 48: 1368-1370 (June 15) 1948.

Recovery Room.—If there is sufficient nursing staff available, a recovery room is an additional safeguard for the patient in order to observe and evaluate her condition more fully before her transfer to the postpartum service.

Areas for Staff Functions.—Such areas should include, near the entrance to the labor and delivery unit, separate facilities where physicians and nurses can change their clothes; in addition, shower and toilet facilities for each group are necessary. Offices should be provided for the obstetric director, the nurse in charge, and the anesthetist. A chart room or area is essential if there is to be adequate recording of the patient's progress in labor and during delivery. It is obvious that adequate scrub-up facilities are necessary, preferably with direct vision into the delivery rooms.

Accessory Facilities.—Accessory facilities should include an obstetric cleanup room, where used supplies and equipment may be taken after a delivery and immediate cleaning performed. If a central supply room is not provided in the hospital, the labor and delivery unit should have its own workroom and sterilization room. Storage areas are essential. The labor unit should have a utility room, equipped to perform sterilization of bedpans, enema equipment, and the like. It is desirable that the labor and delivery unit have a small laboratory equipped to perform an admission urinalysis, emergency blood typing, cross-matching, and Rh determination.

Other Necessary Hospital Services.—As is true in the care of all hospital patients, certain other hospital services are necessary for the care of maternity patients and newborn infants. For example, the hospital should be expected to provide a general laboratory department under the immediate direction of a qualified pathologist and with an adequate and trained laboratory technician staff at all times. Such a laboratory should be able to perform bacteriological, biochemical, hemotological, and pathological determinations.

Another important general hospital service that is necessary is the x-ray department under the immediate direction of a qualified roentgenologist and with an adequate and trained x-ray technician staff at all times. Such a department should be able to perform x-ray pelvimetry according to one of the accepted techniques.

RECORDS

Adequate records of labor and delivery are important if the obstetric director is to be able to evaluate patient care. A continuous and current labor and delivery record book is essential. This record book should contain basic information regarding the identification of the patient, parity, length of labor, type of delivery, type of anesthesia, name of physician performing the delivery and name of consultant if any, name of anesthetist, and condition of fetus or newborn infant, including birth weight. Such data should be summarized monthly and then annually.

Each patient's record should contain information regarding her antepartum care; course during labor, delivery, and the period immediately after delivery; laboratory data, and consultation notes. If the patient attended the hospital's antepartum clinic, her clinic record should be available immediately on her entrance to the labor unit. If she is a private patient, her physician should be expected to send a résumé of her antepartum care to the hospital's labor and delivery unit shortly before the expected date of confinement.

The record of the newborn infant should be initially filled out in the delivery room and should include the essential data regarding the mother as well as initial condition in the delivery room.

STATISTICAL EVALUATION AND STAFF EDUCATION

If improvement in patient care is to be made, there should be opportunity for periodic review of current care. One method by which this objective may be accomplished is the institution of periodic joint staff meetings of the obstetric, pediatric, pathology, and nursing staffs, to discuss problems within the service and to review maternal, fetal, and neonatal mortality and morbidity. This system should be of great educational value to all personnel concerned with the care of maternity patients and newborn infants.

SUMMARY

This report describes some of the essential features of a labor and delivery suite of a hospital maternity service, suggested by members of a hospital consultation service, as a result of surveys of hospitals in a large metropolitan area. The suggestions include obstetric supervision, anesthesia service, nursing supervision and staff, physical setup and equipment, other necessary hospital services, records, statistical evaluation, and staff education.

125 Worth St.

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[4] Recommended Safe Practice For Hospital Operating Rooms, National Fire Protection Association, Boston, 1949.

Infant Feeding.—Nature produced breast milk in the mother to feed the infant for the greater part of the first year. The first teeth do not erupt before six or seven months because nature did not anticipate any need for them. Ptyalin does not appear in the saliva in appreciable amount before the third or fourth month of life. The infant does not learn to use his tongue and jaws to attempt to chew and mix and swallow solid foods before he is three and one-half or four months of age. The intestinal tract is unable to filter out large protein molecules from the food before the child is six or eight months of age. . . . There have been an endless number of various food modifications for infant feeding. None has ever surpassed or ever equaled breast milk as produced by nature. The best substitute for breast milk is a properly prepared cow's milk modified to the approximate composition of human breast milk.—M. G. Peterman, M.D., So-Called "Progress" in Infant Feeding, *Rocky Mountain Medical Journal*, June, 1951.

PRINCIPLES AND FACILITIES FOR THE CARE OF NEWBORN INFANTS IN THE HOSPITAL

Lawrence B. Slobody, M.D.
and
Helen M. Wallace, M.D., New York

In this postwar era of hospital planning, construction and reconstruction, considerable thought and money have gone into the various hospital services. Nationally, interest in the standards of newborn care has been expressed by several groups,[1] and has, of course, been stimulated by the federal Hospital Survey and Construction Act. The pediatrician must actively participate in planning the newborn service.

PEDIATRIC CARE

The service for newborn infants should be under the direct supervision of the pediatric staff of the hospital; this principle has been adopted in many of the teaching hospitals in this country and should be extended to all hospitals. As a corollary of this principle, a qualified pediatrician, usually the director of the pediatric service, should be the director of the newborn service. He should have the responsibility for the establishment of the technical pediatric policies and procedures and for the supervision of the newborn service, so that such policies and procedures are carried out. Daily rounds on this service should be made by the director or by a staff of one or more attending pediatricians appointed by the director.

There should be pediatric house-staff coverage throughout the entire 24-hr. period. The pediatric house staff assigned to the newborn service should have no duties, during such assignment, in the care of sick infants and children on the general pediatric service but it might simultaneously be assigned to the premature center, to the well baby clinic and to the special premature follow-up clinic, if any or all of these services are provided in the hospital. House-staff duties during this period should include assignment to the delivery room for the immediate care of the newborn infant, and possibly also to the antepartum clinic of the hospital, since in these areas the pediatrician can play an important role in patient care. Patterns established in the antepartum and immediate postpartum periods play a vital role in the development of proper parent-child relationships.

The continuous review of care already given infants is an important educational tool in the improvement of such care. One form of educational activity is the periodic pediatric staff meeting, held jointly with members of the obstetric, pathologic and nursing staffs, to review mortality and morbidity. Such a plan necessitates inclusion of one or more members of the pathology department who are interested and trained in the field of neonatal pathology. It also provides for keeping current statistics for the service, including total deliveries, live births,—under and over 5½ lb. (2.5 kg.)—deaths by causes, and infants alive at the time of discharge. Such analysis might be carried further to include a breakdown by color and by type of patient, whether on private or general service.

There is, too, a responsibility for assisting parents in making plans for the continuing medical supervision of the infant after discharge from the hospital, whether such care is to be given by a private physician, hospital well baby clinic or by a community well baby clinic.

NURSING STAFF

The service for the newborn should be under the direct supervision of a registered professional nurse[2] who has had advanced training in all phases of newborn care. She should continue the training of the various persons comprising the nursing and auxiliary staff who care for newborn infants. In addition, experience has shown that there is a close parallelism between the provision of a capable, well-trained nursing supervisor and the quality of patient care rendered on the newborn service. To provide supervision of patient care over the 24-hr. period, there should also be on each shift a head nurse with advanced training in this special field.

For the direct care of the newborn there should be one nurse for every eight full-term newborn infants at all times. Observations have led us to believe that there is little or no significant difference in the amount of nursing care needed by newborn infants during the day, evening, and night periods. Members of the auxiliary nursing staff should at all times work under the supervision of the supervisor or head nurse.

Ideally, the nursing staff for newborn infants in the suspect, or observation, nursery should be separate from that caring for well newborn infants. Since this is not practical in most hospitals, if technique is carefully observed these infants can be cared for by nurses of the regular nursery service. This plan has proved satisfactory when the observation nursery is adjacent to the regular nursery.

Members of the nursing staff of the isolation nursery must be separate from those caring for well newborn infants. This principle must be scrupulously adhered to in order to avoid cross-infection between the isolation and clean nurseries.

PERSONNEL HEALTH POLICIES

The hospital should establish a plan for the health services of its personnel, including those pediatric, nursing, housekeeping and cleaning personnel working in the newborn service. Such a plan should include a preemployment and periodic, usually annual, physical examination including a chest x-ray, and a plan *for the immedi-*

From the Department of Pediatrics, New York Medical College, Flower and Fifth Avenue Hospitals.

[1] (*a*) Standards and Recommendations for Hospital Care of Newborn Infants: Full-Term and Premature, revised edition, Evanston, Ill., American Academy of Pediatrics, 1948. (*b*) Standards and Recommendations for Hospital Care of Newborn Infants: Full-Term and Premature, Publication 292, *Children's Bureau,* 1943.

[2] Losty, M.: Personal communication to the authors.

ate reporting of any illness suggestive of a communicable skin, gastrointestinal or respiratory disease. Such an illness would immediately exclude affected personnel from the newborn service, and they should not be permitted to return to their regular assignments until a physician has certified their recovery. The effectiveness of such a plan would depend on the early reporting of illness and early exclusion from duty. The use of routine stool, nose or throat bacteriological cultures has proved of doubtful value in the control of infection in a service.

PHYSICAL LAYOUT OF NURSERIES

The ideal physical layout consists of the following functional areas: (1) clean, or regular, nurseries for full-term newborn infants; (2) the suspect, or observation, nursery; (3) the isolation nursery, and (4) the formula-preparation room.

Clean, or Regular, Nurseries.—Functionally, the most practical location of the clean, or regular, nurseries is in close proximity to the respective postpartum rooms. This location will facilitate the easy transportation of all normal full-term newborn infants to their mothers for feeding.

Ideally, small nurseries should be provided. The most efficacious plan is to provide space for only eight full-term newborn infants in each nursery room. The chief advantage of such a provision is that, if infection should occur in a specific nursery, its spread, if any, would be limited to only a small number of infants.

A minimum average of 30 sq. ft. per bassinet should be provided in each nursery room to give adequate space around each bassinet, for the completely individualized care of each infant. This average square footage will provide nursery space for a sink and diaper, linen and disposal cans and will make it relatively easy to wheel the scale to the cribside for weighing. In addition, it will accommodate chairs in which the nurse can sit and hold those babies who for one reason or another cannot be taken to their mothers for feeding.

Equipment for each nursery room should be the simplest possible. There should be individual bassinets; a weighing scale on a movable table; a sink providing hot and cold running water and equipped with arm, foot or knee control; bar soap; disposable towels, and discard cans operated by a foot pedal for linen, diapers, and other soiled materials. Each bassinet should have a compartment for a 24-hr. supply of all equipment needed for each infant's care—diapers, linen, oil and its container, and a thermometer. The purpose of this principle of individual care is again to minimize the possibility of cross-infection. There should also be one modern, efficient incubator for every 16 infants, and oxygen and suction equipment for each nursery.

Each nursery room or set of two nursery rooms should have an anteroom and an examination and treatment room. The anteroom will be used primarily as a chart area and will also be the area where the physician scrubs and dons a mask and gown prior to entering the examination and treatment room. The examination and treatment room, as the name implies, is to be used for examination and treatment of infants and also for operative circumcision; it therefore should contain supplies and equipment for this purpose. In addition, it should contain a bottle warmer and refrigerator for formulas. As much glass panelling as possible should be provided between this accessory work space and the nursery proper for ease of observation and supervision.

The Suspect, or Observation, Nurseries.—When the regular nurseries for newborn are located on more than one floor, a suspect, or observation, nursery should also be provided on each floor to lessen the possibility of the introduction of infection from one floor to another. The suspect and clean nurseries should be as close to each other as possible, because they will possibly both be staffed by the same nurse. The data presented above on the regular nurseries, regarding capacity, size and equipment apply equally well to the suspect nursery. The suspect nursery should contain one bassinet for every eight bassinets in the clean, or regular, nurseries.

The suspect nursery is for observation of any newborn infant suspected of having an infectious condition. This nursery, therefore, should also care for newborn infants after a ritual circumcision because of their exposure to fairly large numbers of outside visitors and because of possible infection resulting from such exposure. The suspect nursery should be looked upon as a hub for diagnosis. Thus, any newborn infant suspected of having an infectious condition should be immediately removed to the suspect nursery. If, after a brief period of observation, a diagnosis of infection is made, he is to be removed to the isolation nursery; if on the other hand, an infant is found not to have an infectious condition, he may be returned to the regular nursery.

The Isolation Nursery.—When a general hospital has a well-organized pediatric service, it is more desirable to locate the isolation nursery on this service, since this service is better geared to the care of sick infants than the clean newborn service usually is. Furthermore, it is desirable that infection be removed from the clean service as quickly as possible. Once an infant has been removed to the isolation nursery because of the diagnosis of an infectious condition, he cannot be allowed to return to the regular, or clean nurseries. The data presented above on the regular nurseries regarding capacity, size, and equipment apply equally well to the isolation nursery. The isolation nursery should have one bassinet for each eight bassinets in the clean, regular nursery.

Formula-Preparation Room.—In this era when artificial feeding of newborn infants is not uncommon, formula preparation has become an important function of the newborn service. The formula room should be located away from any infected or contaminated area of the hospital and should be near, or easily accessible to, the largest number of infants it may serve.

In order to separate clean and unclean activities, it is desirable to provide a reception and clean-up room, and a formula-preparation room. In the former room, bottles, nipples, and nipple caps are received from the nurseries and thoroughly washed. In the latter room, formula mixtures are prepared and poured into formula bottles, which are nippled and nipple capped; terminal sterilization is performed at 230 F. for 10 min. or 212 F. for 25 min. Refrigeration may be provided centrally within the formula room or locally within the work-space area of the nurseries. Bacteriological testing of formulas and nipples should be performed by the hospital periodically, preferably weekly, to assure a safe product for the infants.

In general, the recommendations of the American Hospital Association manual on procedures and layout for the infant formula room [3] are valuable and serve as an excellent guide in formula preparation.

POLICIES AND PROCEDURES

The pediatric director, with the help of the supervising nurse of the newborn service, should establish policies and procedures for the functioning of this service. Such policies and procedures should be thoroughly discussed with all groups concerned prior to their establishment, so that those finally agreed upon will be feasible as well as scientifically desirable. For example, some of the procedures with which both the pediatric and nursing care are concerned and in which the availability of nursing time is a factor are (1) frequency of weighing of normal full-term infants; (2) daily care of the skin; (3) frequency of routine temperature taking; (4) use of routine house formulas; (5) use of abdominal binders and umbilical cord dressings; (6) use of gowns and masks by nursing personnel constantly working in clean nurseries.

In such procedures, emphasis must be placed on the elimination of nonessentials; thus, the time of the available nursing staff will be conserved for the really necessary jobs. The available time then may be used for essential procedures and for taking the normal full-term babies to their mothers for all daytime feedings. This latter practice eliminates the universally prevalent technique of propping bottles, with its potential danger of aspiration of formula; at the same time it gives the mother an opportunity to learn how to hold and feed her baby during the period of hospital stay and establishes the normal emotional child-mother relationship. Nursing time should also be available for teaching and educating the mother and father so that they will approach care of the infant with confidence and security.

In the establishment of such policies and procedures, it is usually desirable that a manual be prepared for joint use of the medical, nursing, and auxiliary staffs. This manual should contain emergency standing orders as well as a listing of the agreed-upon policies and procedures. One item of considerable importance is the establishment of policies for consultation with a qualified pediatrician, i. e., for sick and potentially sick newborn infants and for premature infants. In addition, similar policies should be established for consultation with the respective specialists for such conditions as congenital, orthopedic and cardiac deformities, and surgical conditions.

RECORDS

Complete and detailed records of the infant's hospital experience are as necessary for newborn infants as for all hospital patients. The newborn infant should have a record of his own that is separate from that of his mother. However, his record should include pertinent data regarding the mother's course during the antepartum, labor and delivery periods. Such data might include complications of pregnancy, labor and delivery; serological test and determination of the Rh factor; analgesia; anesthesia; length of labor and type of delivery. The record of the newborn infant should begin with his condition and care in the delivery room and should continue with his hospital neonatal course. It should include such items as weight, temperature, respiration, feeding and reactions to feeding, and stools. Admission and discharge physical examinations, progress notes, consultation notes and laboratory data, when indicated, are a necessity.

In addition to the clinical record of the individual newborn infant, it is desirable to have a worksheet or workbook in each nursery kept on a daily basis. Such a book or sheet should contain the name of each infant and such essential information as age; weight; temperature; condition of eyes, mouth, cord, skin, and buttocks; number, size, color and consistency of stools (a code may be used); urine; type and amount of feedings; treatment; medications, and remarks.

COORDINATION OF CARE IN THE HOSPITAL AND IN THE HOME

Ideally, a hospital should have a plan by which, at the request of a physician, all newborn infants are visited in the home by members of a community nursing agency immediately after discharge from the hospital. The purpose of such home visiting is to help the parents carry out the instructions on care of the baby in the home; in other words, such visiting is a link between the teaching program within the hospital and that given through health supervision during the infant's early months and years of life.

However, in this era of nursing shortages, it may not be possible to have all newborn infants visited in the home. Therefore, priority for visiting must be established. Such priority may be given the following infants: those prematurely born; the newborn with birth injuries or congenital malformations, and those born of primiparous or insecure mothers. Each of the above categories may have special problems with which the parent or parents may need considerable assistance.

ACCESSORY SERVICES NECESSARY

Laboratory and x-ray services with an adequate technical staff should be provided within the hospital, so that they will be available when needed for the newborn. There should be a qualified hematologist or pathologist and radiologist, respectively, in charge of such services. Furthermore, post-mortem facilities should be provided, if there is to be an opportunity of learning the lessons potentially available from a review of individual neonatal deaths.

Social service is most important. A social worker can be of great assistance in such problems as placement of illegitimate infants and of babies with such deformities as mongolism, hydrocephalus, and meningocele. She can assist in making a plan for further care of infants with birth injury, congenital cardiac, orthopedic and ophthalmological deformities.

CONCEPT OF FUNCTION OF THE NEWBORN SERVICE

In a general hospital the maternity and newborn services are the only two largely composed of well or normal people. Despite this unique difference, these normal, well, maternity patients and newborn infants have been treated and managed as sick individuals. To our way of thinking, this treatment is entirely artificial and unnecessary and one which works to the disadvantage of the patient. For example, it seems useless to take the temperature of a normal full-term newborn infant routinely every four hours. It likewise seems impractical to look upon such an infant as a "sterile product" that must remain such and therefore cannot be taken out to its mother until the time of discharge of mother and baby from the hospital.

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[3] Procedures and Layout for Infant Formula Room, Chicago, American Hospital Association, 1949.

More and more within the past few years the obstetrician, pediatrician and general practitioner have come to recognize the fallacies in such practices. Certainly, rooming-in when carefully planned has several advantages for the parents and their newborn infant. Not only can the postpartum hospital stay be used as a period of instruction of the parents, but, even more important, the rooming-in plan is an excellent device to foster desirable parent-child relationships and the development of a healthy personality in the child.

SUMMARY

A plan for hospital service for newborn infants is discussed. Topics of this discussion are pediatric care, an adequate nursing staff, personnel health policies, the physical layout and equipment of nurseries, policies and procedures, records, coordination of care in the hospital and in the home, and accessory services. The value of a more flexible system in the hospital care of newborn infants is pointed out.

239 Central Park West.

MIDFORCEPS OPERATIONS

INDICATIONS FOR AND RESULTS OF ONE THOUSAND CASES BASED ON PELVIRADIOGRAPHY AND PROGRESS OF LABOR

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In modern obstetrics, the midforceps operation has become the chief delivery room problem. This operation is usually selected for completion of deliveries in cases of midpelvic arrest caused by malposition or poor uterine or abdominal contractions.

The definition of a type of forceps operation must include reference to fetal and pelvic planes that are ascertainable and constant. For the fetal point of reference, the use of the biparietal diameter is not wise, because in the average obstetrical forceps operation, the obstetrician contents himself with the station of the most dependent portion of the presenting part and the location of the sutures and fontanels for determining position and station. The location of the biparietal diameter is easily determined by a lateral roentgenogram, but determination of its level in the pelvic axis by manual examination is difficult. I, therefore, use and urge the adaptation of the most dependent portion of the presenting part, excluding a caput succedaneum.

Likewise, the pelvic points of reference must be fixed and locatable either by roentgenogram or manually. The use of the ischial spines for designation of the midpelvis and the perineum for the outlet is illogical, because the perineum may be absent in third degree tears or depressed in lacerated perineums in relation to the true pelvis, and furthermore the muscles are not discernible by roentgenograms. The logical plane for one to select as the station of the outlet is the level of the ischial tuberosities, which are fixed and easily located roentgenographically or manually. The plane of the inlet is, of course, the linea terminalis at the level of or slightly below the true conjugate. Therefore, the following definitions are suggested.

A midforceps operation is an obstetrical operation by which a fetus which presents cephalically and whose presenting part is located in the midpelvis, that is, between the planes of the ischial spines and ischial tuberosities, is delivered by forceps. In a floating forceps delivery, the most dependent part lies above the inlet. In a high forceps operation, the presenting part lies between the inlet and spines, and in a low forceps, it lies below the tuberosities. An outlet forceps operation is delivery of a fetus by forceps whose presenting part is easily visible and is distending the perineum and vulva.

Midforceps deliveries are sometimes performed when the patient has been fully dilated for two hours without progress, and the cause of the delay is not known. In some cases, a midforceps operation is indicated when undue maternal distress is apparent either from hemorrhage, toxemia, cardiac disease, tuberculosis, infection, or exhaustion from prolonged labor.

In cases of sudden development of fetal distress from a prolapsed cord, intrapartum hemorrhage, or intrauterine asphyxia from the labor itself, if proper conditions exist, a midforceps operation is selected as the best chance for delivery of a baby before it succumbs to the unfavorable influences of its environment.

In some cases of midpelvic arrest caused by cephalopelvic disproportion, the forceps are wrongly used to terminate labor, and the maternal morbidity and fetal mortality are usually prominent in this type of case. Whereas forceps are contraindicated in cases of disproportion, they are sometimes of great value in delivery of the arrested vertex in cases of pelvic contraction. If the planes and segments of contraction and the pelvic architecture are determined by pelviradiography, the forceps may be used to direct the vertex into relatively more ample planes and segments of the pelvis. By control of the position of the vertex, the various cephalic

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diameters may be presented to the diameters of the pelvis in such a manner that delivery is facilitated. It is by such considerations that Mengert[1] and Caldwell, Moloy, and D'Esopo[2] have attempted to make the forceps operation more of an art than a simple trial and error method of the application of force to a problem arising from the mechanism of labor.

In recent years the indications for forceps operations have been extended to include the solution of soft part dystocia in many of its aspects. In the first stage of labor the cervix may be dilated to 8 cm. and then, notwithstanding the proper combination of time, rest, sedation, intravenous glucose solution, and oxytoxic stimulation, dilatation may cease. Maternal or fetal distress at this stage may indicate the advisability of the termination of labor. If all the other conditions for a forceps operation are present except the fully dilated cervix, namely, engaged head, no disproportion, membranes ruptured, and position known, one may occasionally be able to apply forceps and deliver successfully if the cervix is negotiable or can be made so by regional pudendal, caudal, or saddle block anesthesia, or by general anesthesia. There are also some cases of constriction ring dystocia that can be handled in a similar manner.

Dystocia at the inlet is more readily recognized both clinically and by roentgenogram and early enough for abdominal delivery to be selected rather than a high forceps operation. Outlet dystocia alone must be very rare, because the outlet is almost always more ample than the midpelvis. The only exception is if the pelvis is deformed by injury or metabolic or deficiency diseases, in which case significant outlet dystocia without midpelvic dystocia is possible.

In my own experience, therefore, the chief problem in the delivery room is midpelvic arrest. I and many of my colleagues and associates give more consideration to the decision of performing a midforceps operation than we do to any other obstetrical problem. We look for indications and contraindications to justify our decision. If the result is poor, a question arises: Did we interfere too soon or too late? I know of no other obstetrical decision about which there is always so much criticism and difference of opinion. I have seen many well-trained obstetricians hesitate and procrastinate before attempting an inevitable midforceps operation. On the other hand, we have undoubtedly at times interfered too soon with tragic results. In an attempt to more clearly define the indications and contraindications for the operation, a study of 1,000 patients delivered by midforceps was made. To eliminate unknown factors relating to pelvic architecture and size, only patients who had been subject to pelviradiography were included.

INCIDENCE

The incidence of midforceps operations as represented in this series is difficult to determine, because the material analysed is drawn from many different sources. All were patients on whom midforceps operations were performed, who had had pelviradiography done, and at whose delivery I was present either as the attending or consulting obstetrician or the radiologist. The patients were delivered at the following institutions: Queens General, St. Joseph, Rockaway Beach, Beth Israel, South Nassau Communities, and Mercy Hospitals, all in New York State. In my own practice, the incidence was 11%.

Of the midforceps operations, 72.8% were done on primiparas and 27.2% on multiparas. Since the distribution of primiparas and multiparas in this area is about equal it is clear that the operation is definitely more frequent in primiparas. However, since 27.2% of the midforceps operations were performed on multiparas, it follows that when a multipara is in labor the entire problem is not just for one to await a call that the patient is ready, and then to arrive in time to deliver the baby.

DURATION OF LABOR

The duration of labor at times is difficult to estimate because the onset is often indefinite. A prolonged labor is by definition a labor of 30 hours. From the viewpoint of the patient and her family, labor usually causes anxiety from the time of admission to the hospital. In this series, labor was considered as beginning when contractions were regular, were under 10 minutes, and affected the cervix either by effacement or dilatation. The irregular contractions of uterine hyperirritability were not considered as part of labor.

TABLE 1.—*Incidence of Normal and Prolonged Labor*

Stage of Labor	Normal, %	Prolonged, %
First stage	81.8	18.2
Second stage	91.4	8.6
Both stages	....	2.4

The first and second stages of labor are somewhat different from each other both in the muscles utilized and in the physiological result. The difference is emphasized by study of the incidence of prolonged labor of each stage. I consider a prolonged first stage one over 24 hours. Table 1 indicates that even though a prolonged first or second stage occurred in 26.8% of the cases, in only 2.4% were they combined. This further emphasizes the essential difference between the two stages. In a series of midforceps deliveries, a fairly high incidence of prolonged labor is expected. The usual incidence of prolonged labor is about 3% of all cases. In a series of 85 prolonged labors, Bradford and Woltz[3] reported an incidence of midforceps of 49% and 11% of other major operative procedures. The midforceps operation has always been a mainstay in the termination of prolonged labor, but it should be realized that after 50 hours of labor, 60% of the cases never reach full dilatation, and the conclusion is inescapable that more labor will seldom result in further dilatation or easier delivery. After prolonged labor, the fetal mortality and maternal morbidity of midforceps operations rise sharply, and the attempt to shorten labor before the 50 hour deadline by safe means should be considered.

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[1] Mengert, W. F., and Eller, W. C.: Am. J. Obst. & Gynec. **52**: 1032, 1946. Eller, W. C., and Mengert, W. F.: Am. J. Obst. & Gynec. **53**: 252, 1947.

[2] Caldwell, W. E., and Moloy, H. C.: Am. J. Obst. & Gynec. **26**: 479, 1933. Caldwell, W. C.; Moloy, H. C., and D'Esopo, D. A.: ibid. **28**: 482, 1934; ibid. **28**: 824, 1934; ibid. **30**: 763, 1935; ibid. **32**: 727, 1936; ibid. **36**: 928, 1939.

[3] Bradford, W. Z.; Woltz, J. H. E., and Bradford, W. B.: Am. J. Obst. & Gynec. **58**: 1093, 1949.

INDICATIONS

The indications for forceps operations have been divided according to custom into maternal and fetal indications (table 2). If more than one indication was present, for the sake of simplicity only the major indication was considered. However, in 5.6% of the patients, no obstetrical indication was involved. These operations were usually performed because the station of the vertex was misjudged to be lower than it actually was. Others were delivered because they were under anesthesia when the diagnosis was made. These were usually in multiparas who were anesthetized prematurely by the nursing staff to prevent precipitate delivery. There were some patients delivered without any other indication except that an uncooperative patient was raising such havoc or making such a loud noise that for everyone's comfort the delivery was anticipated by a midforceps operation if the conditions were favorable and no contraindications were present.

TABLE 2.—*Maternal and Fetal Indications for Forceps Operations*

Indication	Percentage
No indication	5.6
Maternal	
Arrest	91.8
Poor contractions	21.8
Lack of voluntary effort	11.8
Combination of poor contractions and lack of voluntary effort	6.0
Pelvic soft part dystocia	8.0
Contracted pelvis	2.0
Disproportion	0.4
Impacted shoulder	0.4
Imprisoned anterior lip	0.2
Cervical rigidity	0.2
Extended head	0.2
Arrest occiput posterior	5.2
Persistent malposition	24.6
Malposition	11.0
Distress	0.6
Exhaustion	0
Hemorrhage	0
Tuberculosis	0
Cardiac	0.2
Toxemia	0.4
Fetal	
Distress	2.0
Asphyxia	1.6
Hemorrhage	0.2
Prolapse of the cord	0.2

There are two groups of maternal indications: arrest or distress during labor. By arrest is meant a lack of progress in either descent or rotation. Definite progress is expected within two hours of good second stage labor contractions if the membranes are ruptured. Very slight progress is of no avail, and unless the labor is progressing toward an easy delivery, further procrastination is usually of no avail, and if no disproportion exists, the results of a midforceps delivery at this time are as good if not better than those attempted after a much longer second stage during which the baby may be damaged by cerebral concussion, intracranial hemorrhage, or be asphyxiated by a tight cord or one shortened by coils around the fetal neck. Such events cannot always be detected by auscultation of the fetal heart, and obstetricians are sometimes surprised to see an asphyxiated baby emerge when the fetal heart was regular and of a normal rate.

If the second stage contractions are weak, progress may well be unexpected within the prescribed time limit. Instead of waiting longer, after one hour I prefer to stimulate the second stage contractions by rupturing the membranes if they are still intact. This usually results in an acceleration of progress in labor. If after one-half hour the contractions are still not powerful, I use oxytocin injection (pitocin®) hypodermically in doses of 1 or 2 minims (0.06 or 0.12 cc.) every 20 minutes for one hour or an intravenous infusion of dilute oxytocin injection. If the contractions fail to result in descent and in rotation, the time indication for midforceps delivery is invoked. I usually look for progress in descent rather than in rotation, because in observing malposition by pelviradiography, I found that if rotation fails to occur during the first stage of labor when the vertex is meeting cervical resistance, or when the membranes rupture allowing flexion, then the next chance is when the presenting part reaches the inclined pelvic floor and the vertex is then in low pelvis, and the midpelvic plane and forceps are bypassed. Therefore, one need not expect spontaneous rotation in the midpelvis once the membranes have ruptured; it certainly is rare. If the vertex is in the occiput posterior or transverse position and if it will not descend below the midpelvis to the perineum, artificial rotation must be substituted in the great majority of cases. This failure of rotation is the indication for 40.8% of the midforceps operations. In seven out of every eight cases in which spontaneous rotation failed to occur, operative rotation was effected, whereas one out of every eight patients had to be delivered by traction to the direct occiput posterior position.

TABLE 3.—*Type of Forceps Used*

Type	Percentage
Simpson type (De Lee), Elliot, Ratzan	12.6
Solid blades (Tucker-McLane)	5.4
Williamson	3.6
Axis-traction (Bill's universal handle or Dewees)	54.8
Barton	2.6
Kielland	21.0
	100.0

CHOICE OF FORCEPS

While the skill and experience of the operator are more important than the selection of the variety of forceps to be used, I *do not subscribe* to the view of some that a good forceps technician should be able to perform all varieties of forceps extraction equally well with the one instrument with which he is most familiar. The varieties of pelvic architecture and of pelvic contraction dictate that maneuvers should be so selected as to make use of the most favorable diameters.[4] If malposition exists, the decision to rotate at the level of arrest or above or below it is of great import.[5] In this study, six types of forceps were used.

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[4] Weinberg, A.: New York State J. Med. 40: 1530, 1940.

[5] Weinberg, A.: West J. Surg. 48: 227, 1940.

PELVIC SIZE

There were no patients with contracted pelvic inlet who were delivered by midforceps. If a patient has a contracted inlet with a borderline or relative disproportion, and a trial of labor does not result in descent below the midpelvis, the patient is not delivered by midforceps but by abdominal section. In the recent study of midforceps deliveries by Steer,[6] about 70% were done for disproportion with a corrected fetal mortality of 3.8%.

There were 2.8% of contracted midpelvis in this series: those in which the interspinous was 9.5 cm. or less, or the posterior sagittal 4.0 cm. or less, none of which were associated with a contracted inlet. The association of a contracted inlet and midpelvis was considered to be an indication for abdominal delivery for a full term pregnancy.[7] In no case was a midforceps delivery of a full term pregnancy attempted when the midpelvic index (sum of the interspinous and posterior sagittal) was less than 13.5 cm.[8] There were six cases of contracted outlet (sum of bituberous diameter and posterior sagittal less than 16.5 cm.). The pelvic outlet index always equals or exceeds the midpelvic index so that it cannot be the definitive cause of disproportion unless there is a funnel effect caused by converging side walls, a narrow subpubic angle, and lower sacral variations. All cases of contracted pelvic outlet were associated with contracted midpelvis. When present, contraction of pelvic outlet and midpelvis contributed to arrest in low pelvis in those cases in which the vertex had passed the plane of least pelvic dimensions, that is, the midpelvis.

RESULTS

The results of any obstetrical procedure ultimately will decide its place in practice.

Mother.—Fortunately there was no maternal mortality. A total of 7.8% significant complications occurred, distributed as follows: sulcus tear 3.2; postpartum hemorrhage 1.6; urinary retention over two days 0.6; third degree perineal laceration 0.6; cervical laceration 0.6; postpartum infection 0.2; parametritis 0.2; Dührssen's cervical incisions 0.2; manual removal of placenta 0.2; phlebitis 0.1; inversion of uterus 0.1; paravaginal hematoma 0.1; fistula in ano 0.1.

Baby.—The fetal mortality was 0.6%. The six deaths were distributed during labor and after delivery as follows: intra partum death (during labor but before delivery), one; stillborn (death during delivery), two; neonatal deaths, three.

Intra partum death was caused by cord strangulation during descent due to three loops of cord around the neck.

Of the stillborn, the first was a 12 lb. baby (5,443.1 gm.) in which death was due to traumatic asphyxiation from impacted shoulders in a multipara. This fetal death was caused by disproportion due to an excessive sized baby in a very obese woman with a family history of diabetes, who is probably also a candidate for this disease. The second was in a primagravida with a 10 lb. (4,535.9 gm.) stillborn baby with a clinical birth injury caused by failure of forceps delivery and subsequently delivered by internal podalic version and breech extraction. An unrecognized malposition was the cause of the failure of forceps operation. Incidentally both of these patients had uncomplicated forceps deliveries with live babies at their next confinements; this rules out contracted pelvis as the cause of the stillbirths.

The three neonatal deaths were due to the following causes: (1) unrecognized occiput posterior with clinical birth injury, no autopsy being performed; (2) an intracranial hemorrhage proved by autopsy that occurred in an uncomplicated midforceps delivery; (3) unknown. Clinically there appeared to be no birth injury.

There were six nonfatal birth injuries all followed by complete recovery: cephalhematoma, two, or 0.2%; transient Erb's palsy, two, or 0.2%, and transient facial palsy, two, or 0.2%. As is well known, intracranial hemorrhage, Erb's palsy, and cephalhematoma may occur in spontaneous deliveries as well and in nearly the same proportion.

COMMENT

In this series of 1,000 midforceps deliveries in patients whose pelves were studied by pelviradiography either before or during labor, the maternal and fetal results were almost as good as could be expected in spontaneous deliveries, and much better than in any series of cesarean sections performed after labor began with which I am familiar.

The tendency in the current literature is to urge almost complete elimination of the midforceps operation: Steer's [6] results in his study of 227 midforceps operations were so poor that he recommended that it be seldom performed. The incidence of complications in his series was as follows: hemorrhage 15%, cervical lacerations 12%, Dührssen's incisions 3%, sulcus tear 23%, fistula 0.4%, maternal mortality 0.4%, and uncorrected fetal mortality 7% corrected to 5.3%.

The indications for the midforceps operation in Steer's series were divided into disproportion 70% and inertia 30%, whereas in my series the corresponding figures were 0.4% and 28%. By contrast, the fetal mortality in the disproportion group was 5.3% in his series, and 0.5% in mine. I never perform a midforceps operation in the presence of known disproportion. The deaths in this series were due to nonrecognition of excessive size babies in pelves of average size.

D'Esopo [9] states that only by reduction of the midforceps incidence to 0.5% and increase of the cesarean rate to 6% will it be possible to eliminate birth trauma to mother and babies and maintain a preventable term fetal loss of 1%. I have kept my preventable term fetal loss to 0.5% with a cesarean incidence of 3% and a midforceps rate of 11%. When one considers that the incidence of rupture of the uterus in subsequent pregnancies occurs in 1.7% and a very thin scar is found in another 2.3%, the later advantages of vaginal delivery are obvious. The immediate complications in 1,000 consecutive cases of cesarean section at Sloan Hospital for Women during the same period as my midforceps series were much higher: infection 10.7%, hemorrhage

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[6] Steer, C. M.: Am. J. Obst. & Gynec. 60:395, 1950.

[7] Weinberg, A., and Scadron, S.: Am. J. Obst. & Gynec. 46:245, 1943.

[8] Weinberg, A., and Scadron, S.: Am. J. Obst. & Gynec. 52:255, 1946.

[9] D'Esopo, D. A.: Am. J. Obst. & Gynec. 59:77, 1950.

14.6%, wound infection 33%, wound disruption 0.2%, thromboembolism 1.8%, intestinal obstruction 0.2%, distention 23.6%, and respiratory 2.8%.

The major indication in my series for midforceps is malposition (40.8%). Rotation of a malposition in the absence of disproportion was performed 356 times without fetal mortality or serious injury. Fifty-two patients with malposition were delivered by midforceps without rotation. According to D'Esopo and Steer, these patients should have been subjected to further labor or section. At least 246 had the further trial of labor up to a full test. Prolonged second stage labor in itself is dangerous, and further trial might have compromised the baby and run the risk of uterine rupture. The other patients were delivered for miscellaneous indications; none required cesarean section as judged by the fetal and maternal results.

The relatively good results in this series are due, I believe, to the use of pelviradiography. Every patient had the benefit of this procedure either before or during labor. The roentgenographic pelvimetry ruled out pronounced pelvic contraction and almost eliminated cephalopelvic disproportion. The knowledge that, if a proper cephalic application is made, sufficient traction will result in delivery gives the operator a feeling of confidence. In only one case did the forceps fail to deliver, and that was because a cephalic application was not made owing to nonrecognition of the position. The knowledge of pelvic architecture aids in the proper selection and execution of the forceps operation. The roentgenogram, incidentally, in a number of cases was a check on a manual determination of station and position.

In cases of borderline midpelvic contraction with possible cephalopelvic disproportion at this plane, a full test of labor is given to allow the biparietal diameter to pass the ischial spines. This was determined by the presenting part being at or slightly below (1 cm.) the ischial tuberosities. If the vertex in an anterior position failed to reach this level, I suspected that the biparietal diameter could not pass through the plane of least dimensions, and a midforceps delivery was not attempted.

SUMMARY AND CONCLUSIONS

The midpelvis is defined as that portion of the true pelvis lying between the ischial spines and tuberosities. In a series of 1,000 midforceps operations in women who had the benefit of roentgenographic pelvimetry before or during labor, the uncorrected fetal mortality was 0.6%, corrected to 0.5%. There was no maternal mortality. The indication for the operation was arrest in 91.8%, of which 40.8% were due to malposition and 39.6% to poor contractions. Only 0.4% were due to disproportion. Distress accounted for 2.6%. The good results in midforceps operations performed in the absence of fetopelvic disproportion are indications for its retention rather than its almost complete replacement by cesarean section.

1462 Greenport Rd.

PREVENTION OF RHEUMATIC FEVER BY PROMPT PENICILLIN THERAPY OF HEMOLYTIC STREPTOCOCCIC RESPIRATORY INFECTIONS

PROGRESS REPORT

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The role of the hemolytic Streptococcus in the precipitation of both initial and recurrent attacks of rheumatic fever is now well established. Furthermore, it is general experience that hemolytic streptococcic respiratory infections in children and young adults who have previously had one or more attacks of rheumatic fever cause recurrence of the disease in 40 to 50% of instances. When the usefulness of sulfonamides in the treatment of streptococcic infections was first discovered, attempts were made at the House of the Good Samaritan to prevent such recurrences by prompt treatment of hemolytic streptococcic infections in known rheumatic subjects with a sulfonamide preparation in the hope that, by suppression of the growth of streptococci in the upper respiratory tract, absorption into the blood stream of the streptococcic substance responsible for precipitating the rheumatic process would be reduced to a subeffective level. These attempts were not successful.[1] Subsequently, when penicillin became available, it seemed reasonable to believe that this antibiotic might be effective where sulfonamides had failed, the basis for this belief being that in vitro penicillin was found to be a more potent antistreptococcic agent than the sulfonamides and that in vivo penicillin was observed to be more effective than the sulfonamides in eradicating hemolytic streptococci from the throats of carriers and of persons with acute hemolytic streptococcic respiratory infections.[2]

From the House of the Good Samaritan (Children's Medical Center) Boston.

Read before a meeting of the American Heart Association, San Francisco, June 22, 1950.

This study was supported by a research grant from the Helen Hay Whitney Foundation.

Most of the oral penicillin used in this study was supplied by the Lederle Laboratories through Dr. Stanton M. Hardy.

[1] Massell, B. F.: Studies on the Use of Prontylin in Rheumatic Fever, New England J. Med. **216**: 487 (March 18) 1937. Massell, B. F., and Jones, T. D.: The Effect of Sulfanilamide on Rheumatic Fever and Chorea, New England J. Med. **218**: 876-878 (May 26) 1938.

[2] (*a*) Goerner, J. R.; Massell, B. F., and Jones, T. D.: Use of Penicillin in the Treatment of Carriers of Beta-Hemolytic Streptococci Among Patients with Rheumatic Fever, New England J. Med. **237**: 576-580 (Oct. 16) 1947. (*b*) Massell, B. F.; Dow, J. W., and Jones, T. D.: Orally Administered Penicillin in Patients with Rheumatic Fever, J. A. M. A. **138**: 1030-1035 (Dec. 4) 1948.

Consequently, in 1945 we began the studies that form the basis of the present report. Our preliminary observations were presented before the American Medical Association in June, 1948, as part of a broad study on various applications of penicillin to the rheumatic fever problem.[2b] Since that time, observations have been continued, and now we have accumulated data on a total of 46 proved clinical hemolytic streptococcic infections in subjects with proved rheumatic fever. Although not even this number of infections is sufficient to permit final conclusions, especially when consideration is given to the number of different serological species of streptococci involved in the infections, the possible practical application of our observations in relation to the problem of rheumatic fever prevention and the interest in such an application expressed at the recent National Conference on Cardiovascular Diseases[3] indicate the need of this progress report.

METHODS OF STUDY

The present report is based on observation on 46 clinical hemolytic streptococcic infections in 40 rheumatic subjects. Thirty-four persons had one infection each; whereas six persons had two infections at different times during the period of the study. With the exception of a 21-year-old girl the patients varied in age from 4 to 16 yr. The average age was slightly less than 10. Fifteen of the infections were in males; 31 were in females.

All the patients were proved rheumatic subjects, in that all gave a good history of one or more attacks of rheumatic fever. Furthermore, most of them had been observed by us personally at the time of at least one of the attacks, and 39 of the streptococcic infections occurred in persons with definite signs of rheumatic heart disease. Seventeen of the infections occurred in patients on the wards of the House of the Good Samaritan, seven in patients convalescing in one of the nursing homes of the Children's Mission to Children, and 22 occurred in ambulatory persons who were being observed carefully in connection with a so-called home study. The patients in the last group were examined in a clinic at weekly intervals and, in addition, were visited in their own homes at the time of all illnesses.

Base-line clinical and laboratory data had been collected on nearly all the patients for some time prior to the development of the streptococcic infections. The preinfection observations included throat cultures for hemolytic streptococci one to three times weekly and determination of the erythrocyte sedimentation rate and the antistreptolysin O titer of the serum at two to four week intervals. At the time of all febrile illnesses, whether or not these were associated with respiratory symptoms, the tests were repeated, and during the subsequent two months the frequency of the tests was increased. Throat culture swabs were planted and streaked directly on blood agar plates containing 5% horse blood. The antistreptolysin O titer was performed by a modification of the method of Hodge and Swift.[4]

In this study we have included only those infections with which there was fever as well as bacteriological evidence of invasion of the upper respiratory tract by hemolytic streptococci. In addition to fever, other symptoms and/or signs of pharyngitis or tonsillitis were usually, but not invariably, present. Pharyngeal or tonsillar exudate was not always observed.

The bacteriological evidence of streptococcic infection in most instances consisted in a change of the throat culture from negative to strongly positive for the hemolytic Streptococcus. In three patients there was a change in the throat culture findings from occasionally weakly positive prior to the clinical infection to strongly positive at the time of the infection. In several patients numerous hemolytic streptococci were cultured from the throat at the time of the clinical signs of infection, but preinfection cultures had not been taken. Subclinical hemolytic streptococcic respiratory infections, in which bacteriological evidence of infection was not accompanied by fever or other clinical manifestations of respiratory illness, were occasionally encountered, but, because of the difficulty in evaluation of these, they have not been included in the present study.[5]

Of the total of 46 clinical hemolytic streptococcic infections, 34 were treated with penicillin. For various reasons 12 infections were not treated with penicillin; these, therefore, served as controls.

In the treated group of patients, an attempt was made to begin therapy as soon as possible after the onset of clinical manifestations of infection; thus the administration of penicillin was usually begun immediately after the throat cultures had been taken and before the results of the cultures were known. Consequently, penicillin therapy was started in many suspected streptococcic infections in which the bacteriological findings failed to substantiate the diagnosis. In these instances, penicillin treatment was discontinued when the results of the throat cultures were obtained, and such infections were excluded from the study. In all streptococcic infections in which the diagnosis was confirmed by the bacteriological findings, penicillin treatment was continued for a total of 10 days. The time that elapsed between onset of symptoms and the beginning of penicillin therapy was usually less than 24 hr., occasionally 36 hr. and in one instance as long as 48 hr.

Five of the patients were treated intramuscularly with aqueous penicillin G in divided doses totaling 120,000 to 400,000 units per day. In the remaining patients, penicillin was administered by mouth in the form of buffered tablets of sodium or procaine penicillin G and usually in doses of 200,000 units five times daily (total of 1,000,000 units per day). For some patients treated at home it was found more practicable to change the dosage schedule after the first five days of treatment to 300,000 units three times daily. Care was always taken to prevent the mixing of penicillin with food by administration of the antibiotic at least one hour before meals and two to four hours after meals. Patients receiving penicillin were not allowed food between meals.

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[3] Proceedings of the National Conference on Cardiovascular Diseases, New York, American Heart Association, 1950.

[4] Hodge, B. E., and Swift, H. F.: Varying Hemolytic and Constant Combining Capacity of Streptolysins: Influence on Testing for Antistreptolysins, J. Exper. Med. 58:277-287 (Sept.) 1933.

[5] Our preliminary report[2b] included five instances of penicillin-treated subclinical hemolytic streptococcic infections none of which was followed by rheumatic fever. Since the preparation of that report we have made no attempt to study subclinical infections; nevertheless, we are aware of two rheumatic fever recurrences which followed untreated infections of this kind.

An attempt was made to determine by the precipitin technique [6] the serological group and type of all strains of streptococci isolated at the time of the infections. Occasionally the strains were temporarily stored in the frozen state, and unfortunately in some of these instances the organisms did not remain viable and consequently could not be tested for their serological characteristics. Data regarding the frequency of group A strains among the hemolytic streptococci isolated from the 46 infections are presented in Table 1. Here it is shown that among the 34 penicillin-treated infections the causative organism was found to belong to group A in 25 instances. In four cases the isolated strains did not belong to group A, and in five instances the streptococci did not grow out and therefore could not be tested. Of the 12 infections not treated with penicillin, 11 were found to be due to group A streptococci.

Table 1.—*Data Regarding Frequency of Group A Strains Isolated from 46 Hemolytic Streptococcic Infections*

	Infections Not Treated with Penicillin	Infections Treated with Penicillin	Total Infections
Strains not isolated for grouping	1	5	6
Non-Group A strains............	0	4	4
Group A strains.................	11	25	36
Total........................	12	34	46

Information regarding the serological type of the group A strains is given in Table 2. Of the 25 group A strains isolated from the penicillin-treated infections, 10 could not be typed with the available precipitin serums. These are referred to as type X. Of the 11 group A strains isolated from the infections not treated with penicillin, three were found to be type X.

FREQUENCY OF RHEUMATIC FEVER RECURRENCES

The frequency with which rheumatic fever recurrences followed the penicillin-treated and the untreated hemolytic streptococcic infections is indicated in Tables 3 and 4. In Table 3 the data have been analyzed without regard to the serological characteristics of the organism isolated at the time of the streptococcic infections, whereas in Table 4 the analysis has been restricted to infections demonstrated to be due to group A streptococci. It is evident that rheumatic fever recurrences followed approximately one-half of the untreated infections, an incidence which is consistent with our previous experience at the House of the Good Samaritan. In contrast, only two (6% to 8%) of the treated infections were followed by rheumatic fever.

Table 2.—*Serological Types of Group A Strains Isolated from 36 Streptococcic Infections*

Type	X*	2	3	4	5	6	12	22	30	41	Total Group A Strains
No. of infections not treated with penicillin	3	0	2	0	2	3	0	0	0	1	11
No. of infections treated with penicillin	10	3	1	1	6	1	1	1	1	0	25
Total infections..................	13	3	3	1	8	4	1	1	1	1	36

* Type X is used to designate those strains which could not be typed with the available serums.

In evaluation of these findings, attention should be called to the fact that in the penicillin-treated series of group A infections the isolated strains could not be typed with the available precipitin serums in 10 instances, and in two instances the streptococci were found to be either type 4 or type 22, two serological types that are believed by many investigators to be frequently nonrheumatogenic. In the untreated infections, type 4 and type 22 strains were not encountered; however, the organisms isolated from three of the infections could not be typed with the available serums. Both of the rheumatic fever recurrences in the penicillin-treated patients resulted from type 2 streptococcic infections. In the control series, recurrences followed streptococcic infections due to type 3 in one case, type 5 in two cases, type 6 in one case, and type X in two cases. None of the untreated infections was due to a type 2 Streptococcus.

Because of these variations in the serological characteristic of the organisms responsible for the respiratory infections and because of the total numbers of infections in the treated and especially in the control series, which are too small for a test of statistical significance, the results of this study should be interpreted with some reservations, and final conclusions should not be made until there has been an opportunity to observe a larger series of infections represented by a wider variety of serological types of streptococci.

Table 3.—*Frequency of Rheumatic Fever Recurrences Following Streptococcic Infections—Irrespective of Serological Group of Isolated Strains*

	No. of Infections	Recurrences	
		No.	%
Infections not treated with penicillin.	12	6	50
Infections treated with penicillin.....	34	2	6

Table 4.—*Frequency of Rheumatic Fever Recurrences Following Streptococcic Infections—Proved Group A Infections Only*

	No. of Infections	Recurrences	
		No.	%
Infections not treated with penicillin.	11	6	54
Infections treated with penicillin.....	25	2	8

Nevertheless, the difference in incidence of recurrences in the treated and untreated groups of patients is impressive and suggests that penicillin therapy of hemolytic streptococcic infections may be effective in preventing subsequent rheumatic fever. This impression is strengthened by the fact, previously mentioned, that prior to the use of penicillin at the House of the Good Samaritan hemolytic streptococcic infections were usually followed by rheumatic fever recurrences in 40% to 50% of instances. The clinical chart of one such rheumatic recurrence (Fig. 1) and, for comparison, the clinical chart of a patient successfully treated with penicillin at the time of a hemolytic streptococcic infection (Fig. 2) are shown.

A more detailed consideration of the clinical course and bacteriological findings in the two patients in whom rheumatic fever developed despite penicillin therapy supports the belief that penicillin played a role in the prevention of rheumatic fever in the remaining patients who were treated with this antibiotic. Both patients in whom therapy failed were convalescing in the same nursing home, and both experienced type 2 streptococcic respiratory infections within a short time of each other—one first became ill on Feb. 2 and the other on Feb 16, 1950. A type 2 clinical streptococcic infection also developed shortly afterward in a third patient who was treated with penicillin and in whom a rheumatic recurrence did not develop. Furthermore, during this same period, type 2 organisms were cultured from the throats of several other patients and personnel in the nursing home who did not present any clinical evidence of respiratory disease.[7]

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[6] Swift, H. F.; Wilson, A. T., and Lancefield, R. C.: Typing Group A Hemolytic Streptococci by M Precipitin Reactions in Capillary Pipettes, J. Exper. Med. 78: 127-133 (Aug.) 1943.

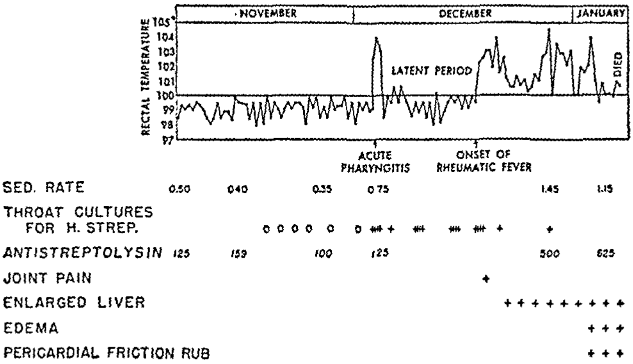

Fig. 1.—Clinical chart of a patient in whom a fulminating and fatal recurrence of rheumatic fever followed a hemolytic streptococcic infection. This episode was observed at the House of the Good Samaritan prior to the discovery of penicillin. Note presence of positive throat cultures and rise in antistreptolysin 0 titer.

Through a misunderstanding, the first patient in whom the type 2 infection developed was not treated with the usual oral dose of penicillin (200,000 units five times daily) until three days after the onset of his first symptoms. Instead, he received two doses of 200,000 units each on the evening of the first day (12 hours after the onset of clinical manifestations) and only 100,000 units five times during the second day. Despite this delay in the use of full penicillin dosage, the clinical respiratory manifestations subsided promptly and the throat cultures became negative for hemolytic streptococci. On Feb. 15, three days after discontinuation of penicillin therapy and 13 days after the onset of the initial streptococcic infection, the patient again experienced a high fever and the throat culture once more revealed the presence of numerous type 2 streptococci. This recurrent infection was treated within 12 hours with full oral doses of penicillin (200,000 units five times daily) and during a 10-day course of therapy the patient became clinically well and apparently free from streptococci. A throat culture taken five days after discontinuation of the second course of penicillin was reported as negative, but after another seven days (22 days after the second streptococcic infection) fever, joint pains, and other manifestations characteristic of rheumatic fever suddenly developed. A throat culture taken at this time revealed once more the presence of numerous type 2 streptococci. A clinical type 2 streptococcic infection developed in the second patient on the evening of Feb. 16, the day after the recurrence of infection in the previously described patient. This second patient received 200,000 units of penicillin orally within several hours after his first clinical symptoms and then, beginning the next morning, 1,000,000 units daily for another 10 days. Although there were no further clinical signs of respiratory infection, type 2 organisms reappeared in large numbers in the throat culture beginning one week after administration of the last dose of penicillin and were frequently cultured from the throat thereafter. About four weeks after the initial streptococcic infection and 10 days after the first reappearance of type 2 streptococci in the throat, the patient became ill with definite manifestations of rheumatic fever.

From the available facts it is not possible to determine whether the return of type 2 streptococci in the throats of these two patients after the discontinuation of penicillin therapy was due to reinfection contracted from other persons in the same house who harbored the organisms and to whom they were exposed or whether it was due to suppression but incomplete eradication of the streptococci from the respiratory tract during therapy and subsequent regrowth of the organisms, when they were no longer subject to the influence of the antibiotic. In either case it is evident that recurrent streptococcic infections developed in both patients, and it seems possible that these infections were responsible for the rheumatic fever which developed shortly thereafter.

Support for this interpretation is offered by the follow-up throat culture data obtained in 30 of the 32 remaining penicillin-treated patients, in none of whom did rheumatic fever develop. In 25 of these, the throat cultures became negative for hemolytic streptococci soon after the beginning of penicillin therapy and remained negative after the discontinuation of the antibiotic. In four cases, the throat cultures remained negative during therapy but occasional weakly positive cultures, indicating incomplete suppression of the organisms, were obtained after completion of treatment. In only one instance, in which the infecting organism was a somewhat penicillin-resistant nongroup A Streptococcus, did strongly positive cultures persist despite penicillin treatment. The bacteriological findings, then, in the "successful" penicillin-treated patients contrast strikingly with those in the two "failures" and suggest that the development of rheumatic fever in the latter patients was due to incomplete suppression of the organisms or to reinfection.

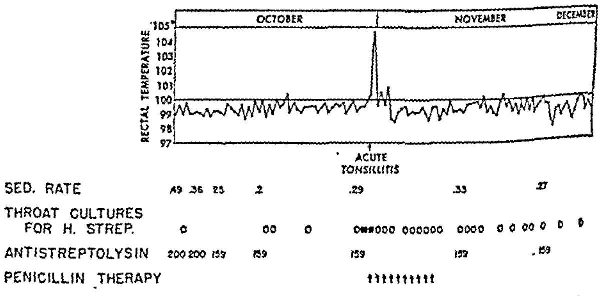

Fig. 2.—Clinical chart of a patient treated with penicillin at the time of a hemolytic streptococcic infection. This infection was not followed by an increase in rheumatic fever activity. Note prompt disappearance of streptococci from the throat flora and failure of antistreptolysin 0 titer to rise.

This interpretation, in turn, raises a question, which may be of practical importance but which cannot be answered without further study: Could the two instances of rheumatic fever recurrence have been prevented by more effective penicillin treatment (larger oral doses or intramuscular therapy), by treatment for longer than 10 days, or by the administration of penicillin to the other members of the house so that reexposure and reinfection might be prevented?

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[7] Drs. Rebecca C. Lancefield and Stuart D. Elliott of the Hospital of the Rockefeller Institute assisted in the identification of the type 2 strains.

THE ANTISTREPTOLYSIN O RESPONSE

One of the toxins produced by hemolytic streptococci is an oxygen labile hemolysin known as streptolysin O. This substance is antigenic and, when released during streptococcic infection, stimulates the production of an antibody called antistreptolysin O. In the course of the present study a sufficient number of blood samples were obtained from 10 of the patients with untreated infections and from 27 of those with penicillin-treated infections, to allow for an accurate determination of the response of the antistreptolysin 0 titer.

Table 5, in which these observations are recorded, shows that a significant rise in titer (two tubes or more) followed all 10 (100%) of the untreated infections but only 10 (37%) of the penicillin-treated infections. A rise of four tubes or more was observed in nine (90%) of the untreated infections and in only four (15%) of those in which penicillin was administered. These data suggest that penicillin therapy of hemolytic streptococcic infections suppresses the antistreptolysin O response. Similar observations have also been made by other investigators.[8]

TABLE 5.—*Antistreptolysin O Response in 27 Infections Treated with Penicillin and in 10 Infections Not Treated with Penicillin*

Maximum Increase [illegible]	0	1	2	3	4	5	6	7	8	9	10	Total Infections
Untreated infections	0	0	1	0	2	4	1	0	0	1	1	10
Penicillin-treated infections	14	3	4	2	2	1	1	0	0	0	0	27

* The antistreptolysin 0 test is so set up that the difference in the logarithms of the absolute titers in any two adjacent tubes is equal to 0.10.

The antistreptolysin O response, or, for that matter, the development of any other antibody, has not yet been definitely implicated in the mechanism by which rheumatic fever is precipitated by hemolytic streptococcic infections. Nevertheless, the fact that penicillin therapy can interfere with the elaboration of an antigen sufficiently to influence the antibody response is perhaps significant and suggests that this therapy similarly may interfere with the elaboration of the unknown streptococcic substance responsible for the production of rheumatic fever.

SIGNIFICANCE OF FINDINGS IN RELATION TO GENERAL PROBLEM OF RHEUMATIC FEVER PREVENTION

The problem of rheumatic fever prevention can be divided into two phases. The first is concerned with the prevention of recurrences; the second involves the prevention of initial attacks of the disease.

It is well known that rheumatic fever is a repetitive disease [9] and that with each new episode the degree of cardiac damage may be increased. Furthermore, the mortality from first attacks of rheumatic fever is relatively low, most deaths from rheumatic heart disease, at least in children and young adults, being traceable directly to recurrences of active rheumatic fever. Hence, anything that can be done to reduce the incidence of such recurrences should contribute toward the lowering of the mortality from and the reduction of the crippling effects of this disease.

The data that have been presented suggest that prompt and adequate penicillin therapy of hemolytic streptococcic respiratory infections in rheumatic subjects may be effective for this purpose. At the same time attention should be directed to the fact that approximately 40% to 50% of rheumatic episodes result from hemolytic streptococcic infections with which there are associated no fever or other clinical manifestations or in which symptoms are so mild that they are overlooked.[10] Obviously such infections, not being clinically recognizable, could ordinarily not be treated with penicillin and, therefore, even if prompt penicillin therapy of clinical hemolytic streptococcic infections should prove to be effective for rheumatic fever prevention, the maximum reduction in risk that could be expected by the method would be 50% to 60%.

Therefore, for childen and young adults who have had one or more previous attacks of rheumatic fever an attempt to prevent, in the first place, the development of all hemolytic streptococcic infections, subclinical as well as clinical, would seem to be a method of prophylaxis preferable to one which depends on the treatment of already developed infections. That the continuous daily administration of sulfadiazine or other sulfonamide in small doses may be useful for the prevention of streptococcic infections, and hence for the prevention of rheumatic fever recurrences, has already been demonstrated,[11] and data are now accumulating which suggest that daily oral penicillin may be even more effective for this same purpose.[12]

The second phase of the problem of rheumatic fever prevention is concerned with initial attacks of the dis-

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8. Rantz, L. A.; Boisvert, P. J., and Spink, W. W.: Hemolytic Streptococcal Sore Throat: Antibody Response Following Treatment with Penicillin, Sulfadiazine (Sulfonamide) and Salicylates, Science **103**: 352-353 (March 22) 1946. Weinstein, L., and Tsao, C. C. L.: Effect of Types of Treatment on Development of Antistreptolysin in Patients with Scarlet Fever, Proc. Soc. Exper. Biol. & Med. **63**: 449-450 (Nov.) 1946. Kilbourne, E. D., and Loge, J. P.: The Comparative Effects of Continuous and Intermittent Penicillin Therapy on the Formation of Antistreptolysin in Hemolytic Streptococcal Pharyngitis, J. Clin. Investigation **27**: 418-424 (July) 1948. Weinstein, L.; Bachrach, L., and Perrin, T. S.: Studies of the Influence of Penicillin on the Immune Reactions in Streptococcal Pharyngitis, J. Clin. Investigation **28**: 817-818 (July) 1949.

9. Jones, T. D., and Bland, E. F.: Rheumatic Fever and Heart Disease: Completed 10-Year Observations on 1,000 Patients, Tr. A. Am. Physicians **57**: 267-270, 1942. Bland, E. F., and Jones, T. D.: Rheumatic Fever and Heart Disease: Follow-Up Studies, Arch. Inst. cardiol. México **15**: 349-359 (Oct. 31) 1945.

10. Massell, B. F., and Jones, T. D.: Epidemiology of Hemolytic Streptococcal Respiratory Infections and Rheumatic Fever at the U. S. Naval Training Station, Newport, Rhode Island: Final Report to OSRD, May 10, 1946. Massell, B. F., and Sturgis, G. P.: Factors Influencing the Development of Rheumatic Fever Recurrences, unpublished.

11. Thomas, C. B., and France, R.: A Preliminary Report of the Prophylactic Use of Sulfanilamide in Patients Susceptible to Rheumatic Fever, Bull. Johns Hopkins Hosp. **64**: 67-77 (Jan.) 1939. Coburn, A. F., and Moore, L. V.: The Prophylactic Use of Sulfanilamide in Streptococcal Respiratory Infections, with Especial Reference to Rheumatic Fever, J. Clin. Investigation **18**: 147-155 (Jan.) 1939. Kuttner, A. G., and Reyersbach, G.: The Prevention of Streptococcal Upper Respiratory Infections and Rheumatic Recurrences in Rheumatic Children by the Prophylactic Use of Sulfanilamide, J. Clin. Investigation **22**: 77-85 (Jan.) 1943. Rosenberg, E. F., and Hench, P. S.: Recent Advances in the Treatment of Rheumatic Fever, with Special Reference to Sulfonamide Prophylaxis and Intravenous Salicylate Therapy, M. Clin. North America **30**: 489-509 (May) 1946.

12. (a) Massell, Dow and Jones.[2b] (b) Massell, B. F.: Effect of Orally Administered Penicillin on the Carriage of Hemolytic Streptococci: Significance in Relation to Use of Penicillin for Rheumatic Fever Prophylaxis, to be published.

ease. If penicillin treatment of hemolytic streptococcic infections suppresses the growth of streptococci in the upper respiratory tract sufficiently to reduce the elaboration of the unknown rheumatic fever-producing substance to subeffective levels in persons who have previously had one or more attacks of rheumatic fever and who are presumably unusually vulnerable to the disease, it seems reasonable to expect that similar treatment would have a similar effect in persons who are susceptible to rheumatic fever but who have not yet had an attack. The validity of this inference is supported by the recent report of Denny and co-workers,[13] who observed *in an air force training base only two cases of definite* rheumatic fever in 798 young men with streptococcic infections treated with penicillin in contrast to 17 definite attacks of the disease in 804 untreated patients. On the other hand, Weinstein and his associates [14] observed rheumatic fever in 12 (7%) of 167 scarlet fever patients treated with penicillin and concluded that "the treatment of scarlet fever with crystalline penicillin G does not prevent the development of rheumatic fever."

Although these latter studies raise some doubt about the value of penicillin therapy of streptococcic infections for rheumatic fever prevention, attention should be called to the fact that most of Weinstein's cases of rheumatic fever were extremely mild and in many the diagnosis rested on slight changes in serial electrocardiograms. The extreme mildness of the disease process in these patients is indicated especially by the fact that in all but one the sedimentation rate was not elevated, a finding which contrasts strikingly with our experience at the House of the Good Samaritan, where, except in the presence of congestive heart failure, normal sedimentation rates in patients with other clear evidence of active rheumatic fever have been observed rarely. Even if Weinstein's criteria for rheumatic fever are accepted, the possibility must be considered that the incidence of a similar mild rheumatic process would have been a great deal higher than 7% in his scarlet fever patients had they not been treated with penicillin.

From the foregoing discussion it is evident that further observations will be necessary before any final conclusions can be drawn regarding the value of treating hemolytic streptococcic infections as a method for preventing initial attacks of rheumatic fever. Nevertheless, the available data are sufficiently suggestive to warrant optimism about the results which will be revealed by further studies.

SUMMARY AND CONCLUSIONS

Rheumatic fever recurrences in rheumatic subjects developed after only two out of a total of 34 hemolytic streptococcic infections in which penicillin therapy was begun promptly and continued for 10 days. In contrast, there were six instances of rheumatic fever following 12 similar infections in which penicillin therapy was not used. The administration of penicillin also appeared to suppress the antistreptolysin 0 response in many cases. These observations suggest that prompt and adequate penicillin therapy of hemolytic streptococcic infections in rheumatic subjects is effective in reducing the incidence of rheumatic recurrences. However, because of the relatively small number of cases involved in this study and because of the variety of serological groups and types of streptococci associated with the infections, final conclusions are not yet warranted. The observations also support other investigators' studies which suggest that the incidence of initial attacks of rheumatic fever can be reduced by penicillin therapy of clinical streptococcic respiratory infections. Prompt penicillin therapy of streptococcic infections is not recommended as a substitute for the use of continuous prophylactic measures in persons who have had one or more attacks of rheumatic fever.

25 Binney St.

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[13] Denny, F. W.; Wannamaker, L. W.; Brink, W. R.; Rammelkamp, C. H., Jr., and Custer, E. A.: Prevention of Rheumatic Fever: Treatment of the Preceding Streptococcic Infection, J. A. M. A. **143:** 151-153 (May 13) 1950.

[14] Weinstein, L.; Bachrach, L., and Boyer, N. H.: Observations on the Development of Rheumatic Fever and Glomerulonephritis in Cases of Scarlet Fever Treated with Penicillin, New England J. Med. **242:** 1002-1010 (June 29) 1950.

RHEUMATIC HEART DISEASE IN PATIENTS OVER SIXTY YEARS OF AGE

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and
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Rheumatic fever and rheumatic heart disease are usually considered to be diseases of the young. The average age of onset of rheumatic fever has been calculated in several series of cases with rheumatic heart disease. In 3,129 deceased patients studied by Cohn and Lingg [1] it was 14.5 ± 0.3 years for males and 15.0 ± 0.3 years for females; in 644 patients observed by De Graff and Lingg [2] it was 17 years; in 1,042 children observed by Wilson and Lubschez [3] it was 6.5 years. There are reports, however, of initial episodes of rheumatic fever in the seventh decade.[4] Among 3,741 patients with rheumatic fever entering Bellevue Hospital from 1911 to 1919, Lambert [5] found 91 over the age of 60.

Older data on the duration of life after the initial manifestation of rheumatic fever in the course of rheumatic heart disease indicate a poor prognosis. Cohn and Lingg [1] found the mean duration of life to be 13 years; De Graff and Lingg,[2] 15 years. In contrast to these, Wilson and Lubschez's study [3] demonstrated that the median duration of life for rheumatic children (with cardiac involvement) is greater than 30 years after onset. The discrepancy between the first two reports and the last is

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This article has been shortened for publication in THE JOURNAL by omission of tables 1, 2, and 3. These will appear in the authors' reprints.

From the Department of Medicine, New York University College of Medicine; the Adult Cardiac Clinic and wards of the Third (New York University) Medical Division, and the Pathological Laboratories of Bellevue Hospital.

attributable to the selection of different groups of rheumatic patients. As Swift and Cohn[6] noted:

> . . . De Graff's cases, from Bellevue Hospital, were originally chosen because they had reached the stage in their cardiac career where they had symptoms of cardiac insufficiency from which they subsequently died; rheumatic children who died early as well as those who later did not develop cardiac symptoms were not included.

The latter constitute possibly 30 to 50 per cent of young rheumatic cardiac patients.[7] They would also be excluded from studies such as reported by Wilson and Lubschez and by Cohn and Lingg. Heart disease in them is usually discovered by routine thoracic x-rays and by physical examinations made for some other purpose. In some the discovery of gross rheumatic lesions is an incidental finding at necropsy.[8] Microscopic evidence of rheumatic cardiac lesions is even more often an incidental finding, the frequency depending somewhat on the pathological criteria for rheumatic disease used.[9]

Although the average duration from onset to termination of rheumatic heart disease is relatively short, there are extremes on either side of the mean. Some patients die in heart failure during their first bout of rheumatic carditis or within a decade of its onset. Others recover, have no recurrences, and survive for 40 years or more with valvular disease; they ultimately die of an unrelated disease without ever having had myocardial insufficiency.[10] Isolated cases with an interval varying from 54 to 63 years between the initial attack of rheumatic fever and the final clinical observations have been reported.[11] In one series of 12,000 patients[1] there were 75 who died at 60 years of age or over, and 25 patients over 60 years of age were still living at the time of the report.[12]

White and Bland[13] explained the benign clinical course of rheumatic heart disease with long survival on the basis of (1) a relatively mild degree of mitral stenosis; (2) the development of rheumatic heart disease in later life; (3) the relatively quiet, careful mode of living, and (4) probable ancestral longevity. Other reasons for longevity often given are the development of hypertension (Baker and Musgrave,[4] and Cookson[14]); the infrequency or mildness of recurrent rheumatic activity (Cohn and Lingg,[1] Baker and Musgrave,[4] and Wilson[15]); the absence of atrial fibrillation (Cookson[14] and Kossmann and Connor[16]); involvement of the mitral valve to the exclusion of other valves (Cabot[17]); the presence of chorea as the sole rheumatic manifestation (Cohn and Lingg[1]).

The present study was undertaken for three reasons: (1) to find, if possible, the causes for longevity in a selected group of patients with rheumatic heart disease and over 60 years of age; (2) to learn what clinical data, if any, might be of use in recognizing rheumatic heart disease so often overlooked in the aged; (3) to dispel the common clinical notion that advanced age and rheumatic heart disease are incompatible.

METHODS

The 71 patients in the study were observed in the Adult Cardiac Clinic and on the wards of the Third Medical Division of Bellevue Hospital. A few were private patients seen in consultation. Criteria used in their selection were (1) the presence of clinical or necropsy evidence of gross rheumatic heart disease; (2) age of 60 years or over at the time of the last observation or at the time of death.

The criterion used in the clinical diagnosis of rheumatic heart disease was the finding of physical and laboratory evidence of a characteristic structural lesion in the heart.[18] In all but four this "characteristic" structural lesion was mitral stenosis with or without other valvular disease. In the four exceptions there was clinical evidence of aortic valvular disease alone (cases 7, 12, 19, and 28), a good history of rheumatic fever, and discovery of heart disease in three early in life. In 48 patients there was a history of rheumatic fever; in all but 6 one of the major manifestations, namely polyarthritis, chorea, or carditis, had occurred. The pathological criteria for rheumatic disease, present in all of the 20 patients who came to necropsy, were those defined by de la Chapelle, Graef, and Rottino.[19] Actually, 14 of these were included in the report made by these authors.

RESULTS

Clinical and Pathological Results.—The case summaries have been arranged in three groups, each in the order of decreasing age of the patients. The first includes 36 patients alive at last observation (table 1); the second includes 15 patients who died but did not come to necropsy (table 2); and the third includes 20 patients who came to necropsy (table 3). Table 4 is an over-all summary of the three groups.

Six patients in the series had rheumatic heart disease for 60 years or longer. Four of these were alive and well at last observation. One patient (M.Do.), 80 years of age, had chorea and "irregular heart action" at the age of 14, and polyarthritis at 22 and 31 years. She had nine normal pregnancies and one miscarriage, and is still physically active.

In 48 patients (68%) in whom there was a history of a rheumatic manifestation in the past (carditis, polyarthritis, chorea, scarlet fever, or "rheumatic fever"), the average age of onset was 21.5 years; the average age at time of death or at the time of the last clinical observation was 66.9 years, and the mean duration from the onset of rheumatic fever to the last recorded age was 43.6 years. The average age of onset was therefore 4.5 to 15 years later than in previously reported series (Cohn and Lingg,[1] De Graff and Lingg,[2] and Wilson and Lubschez[3]), but the scatter was considerable (from 5 years to 55 years of age). Statistical proof of the significance of the difference in means of age at onset of the present series and of the series of Cohn and Lingg's deceased patients was obtained by the method of unpaired comparisons using the "standard deviation of each sample" method. The ratio (t) of the difference between the means to the standard error of this difference was 3.84 in the case of the males of Cohn and Lingg's series, and 3.57 in the case of the females. Both values are greater than the probability level of 2.6 of the normal curve ($P < 1\%$), and therefore are highly significant statistically. This means that the later mean onset of rheumatic fever in the present series was very probably a determining factor in longevity.

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Ancestral longevity as a factor in determining long life with rheumatic heart disease is most difficult to evaluate. The average age of the mother was 60.7 years in 29 instances; the average age of the father was 64.9 years in 29 instances. Of the total of 58 parents, two-thirds were over 60 years of age. With few exceptions, these averages represented the age of death of the parents. There were six patients with one parent and two patients with both parents who were over 80 years of age. A conclusion from these data cannot be drawn without recourse to a lengthy statistical analysis which should include several types of control groups.

TABLE 4.—*Summary of Course of Rheumatic Heart Disease in Seventy-One Patients Over Sixty Years of Age*

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Group and Number	Sex Male	Female	Average Age	Age of Onset of Rheumatic Fever	Age of Diagnosis of Rheumatic Heart Disease	Age of First Diminution in Cardiac Reserve	Age of First Bout of Congestive Heart Failure	Age Digitalis Begun	Duration from Onset (3)-(4)	Duration from First Diminution in Cardiac Reserve (3)-(6)	Duration from First Bout of Congestive Heart Failure (3)-(7)	Duration from Onset Rheumatic Fever to First Diminution in Cardiac Reserve (6)-(4)
1 (36 living)	14	22	68.2	17.3	44.4	50.2	57.9	56.2	47.4	15.3	9.6	37.7
2 (15 dead—no necropsy)	10	5	64.3	28.4	54.4	56.4	58.5	62.5	36.6	9.2	7.2	29.3
3 (20 dead—necropsy)	13	7	66.4	25.0	60.7	60.4	62.1	62.9	41.6	7.7	4.7	35.3
Mean	..	..	66.9	21.5	50.7	64.4	59.5	59.7	43.6	12.2	7.9	30.6
No. cases in mean	..	..	71	48	64	62	51	48	48	51	31	47

Recurrences of rheumatic fever were not inconsiderable (tables 1, 2, and 3). There were 16 patients (30% of those with a history of a rheumatic manifestation) who had multiple attacks of rheumatic fever in some form. Four had only two attacks. One had the maximum number of six; this patient (J.Ho.) was last examined at the age of 63, 31 years after the first attack (table 1). The high frequency of recurrences in the series suggests that recurrences alone were not related to longevity, although this is not absolute. Perhaps the relatively older average age of recurrences, just as the older average age of onset, was the important factor. There was, of course, no way of evaluating the significance of severity of initial or subsequent attacks of rheumatic fever.

Only 2 patients had chorea, usually regarded as a mild manifestation so far as the heart is concerned.[1] However, both of these had, in addition, polyarthritis during other attacks.

The varieties of valvular lesions were of interest particularly since it is believed by some (Levine,[10] Rothschild, Kugel and Gross,[10] Criteria Committee of the New York Heart Association [18] and Stewart and associates [20]) that certain combinations alter the hemodynamics in a favorable way. Of the 71 patients (table 6), 42 (59.1%) had mitral stenosis and insufficiency; 22 (30.9%) had combined mitral and aortic lesions; three had combined mitral and tricuspid lesions; and four had aortic disease alone. In the 20 necropsied cases none displayed aortic lesions alone (table 5). It is difficult to conclude that any one lesion or combination of lesions accounted for longevity since similar distributions occur in any age group. To be noted particularly is the paucity of patients with tricuspid stenosis (2 proved, 1 questionable), and the presence of a tight mitral valve in several (table 3, cases 4, 6, 9, 14, and 17). Although table 5 shows a smaller mean weight of the hearts with tricuspid stenosis and a larger mean weight with aortic valve disease as compared to the weight of hearts displaying mitral lesions alone, it is probable that the total number of cases of each type is too small to draw conclusions.

Atrial fibrillation is also regarded as a terminal event in the disease, although durations in excess of 20 years have been reported (Kossmann and Connor [16] and Bishop and Bishop, Jr.[21]). In the present series, 33 patients displayed this arrhythmia at some time. Of these the duration was fairly certain in 16, where it averaged five years. However, 9 patients displayed the rhythm for more than five years, and the maximum duration was 14 years. Other abnormalities encountered electrocardiographically are shown in table 6.

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Only 9 patients (table 7) had a blood pressure persistently above 150 mm. Hg. systolic and 90 mm. Hg. diastolic. Six of these displayed atrial fibrillation. Hypertension, therefore, was not a frequent finding (7.9%) in the series.

A point of interest from the viewpoint of differential diagnosis was the mean duration of diminished cardiac reserve (table 4) which in 51 patients was 12.2 years (maximum 53, minimum 0). The mean duration of life after the first bout of heart failure was 7.9 years (maximum 30, minimum 0). It was the impression that these relatively large values would be helpful in suspecting the disease clinically. To this end a comparison was made with similar values determined in a group of 138 patients with degenerative (hypertensive and/or arteriosclerotic) heart disease. These lived on the average 1.8 years after the appearance of the first evidence of congestive heart failure, although 24% were alive three years after.[22] These figures would seem to substantiate the clinical impression that rheumatic heart disease is to be suspected when the course is characterized by prolonged cardiac disability.

TABLE 5.—*Summary of Valvular Lesions and Heart Weight in Eighteen Necropsied Cases* * †

Diagnosis (Anatomical and Clinical)	MS, MI	MS, MI, AS, AI	MS, MI, TS
Male	8	5	—
Female	5	—	2
Total	13	5	2
Average heart weight in grams	527	677	450

* Two cases are not included because the weight of the heart was omitted in the autopsy protocol.

† Abbreviations used in this table: AI, aortic insufficiency; AS, aortic stenosis; MI, mitral insufficiency; MS, mitral stenosis; TS, tricuspid stenosis.

TABLE 6.—*Summary of Electrocardiographic Abnormalities in Relation to Valvular Lesions* *

	Total	MS, MI	MS, MI, TS	MS, MI, AI	MS, MI, AS, AI	AS, AI	AI
Total patients	71	42	3	13†	9	2	2
Male	38	18	..	9	8	1	2
Female	33	24	3	4	1	1	..
Normal sinus rhythm	20	11	..	4	3	2	..
Auricular fibrillation	33	21	3	7	2	..	..
Auricular flutter	1	1	..	..	..	..	..
Auricular tachycardia	1	..	..	1	..	..	..
Paroxysmal auricular fibrillation	1	..	..	..	..	1	..
Sinus tachycardia	1	1	..	..	..	..	..
Sinus bradycardia	3	1	..	..	..	..	2
Bundle branch block—right	2	2	..	..	..	..	..
Bundle branch block—left	1	1	..	..	..	..	..
Bundle branch block—type unclassified	1	..	..	..	1	..	..
Deviation of electrical axis—none	30	21	1	3	3	..	..
Deviation of electrical axis—right	5	3	1‡	1	..	..	..
Deviation of electrical axis—left	23	10	1	7	1	2	2

* Abbreviations used in this table are explained in table 5.

† Patient D. Co. (living, no. 4), questionable aortic stenosis.

‡ Patient L. Re. (living, no. 30), questionable tricuspid stenosis.

It was not possible to determine the causes of heart failure in the group. In this regard the hearts of only three patients displayed evidence of rheumatic activity at necropsy.[6] This was out of a total of 12 which were examined microscopically. This is comparable to a recently reported series of elderly rheumatic cardiacs[23] in which four of 16 patients over 60 years old showed lesions of rheumatic activity at necropsy.

A point of considerable clinical interest is that the diagnosis of rheumatic heart disease, particularly of mitral stenosis, was missed during life in eight of the 20 patients who came to necropsy (table 3).

Electrocardiographic Results.—The standard leads were available in 58 patients, precordial leads in a few, and intracardiac leads in one. The findings are summarized in table 6. Of greatest interest is that only five of the 58 displayed right deviation of the axis of QRS (angle alpha greater than + 90 degrees or less than — 90 degrees), and only two displayed right bundle branch block (patients M.Ca. and S.Pa.). One patient (F.Mc.) who displayed a right ventricular wall 1.2 cm. thick at necropsy, showed a right deviation of the mean axis of QRS, and a low voltage rsR′ in the lead from the right sternal edge but the QRS interval was 0.08 sec. An insufficient number of precordial leads were available in other cases to make any further statements about them. It is often stated that disease of the mitral valve among other things should be suspected in older patients if the electrocardiogram displays right deviation of the electrical axis of QRS. This is probably true but the present electrocardiographic observations indicate that the diagnosis will be missed in the majority of older patients with rheumatic mitral stenosis if too much reliance is placed on this finding.

TABLE 7.—*Analysis of Nine Cases with Hypertension*

	MS, MI*	MS, MI, TS*	MS, MI, AI*	MS, MI, AS, AI*	Total
	3	1	3	2	9
Male	1	..	2	2	5
Female	2	1	1	..	4
Age onset rheumatic fever	10 (unknown in 2)	Unknown	14 (unknown in 2)	18 (unknown in 1)	10, 14, 18 (unknown in 6)
Left axis deviation	..	..	1	1	2
Right axis deviation	..	1	..	..	1
No deviation electrical axis	3	..	1	..	4
Auricular fibrillation	3	1	2†	1	7
Normal sinus rhythm	..	..	1	1	2

* Abbreviations used in this table are explained in table 5.

† 1 paroxysmal.

SUMMARY AND CONCLUSIONS

The clinical course of 71 patients over 60 years of age with rheumatic heart disease was reviewed for the purposes of determining the factors responsible for their

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longevity and of noting any manifestations which might make the clinician suspect the presence of the disease.

Of those possible factors in longevity which could be analyzed, including the degree of mitral stenosis, ancestral longevity, accompanying hypertension, infrequent recurrences of rheumatic fever, absence of atrial fibrillation, univalvular involvement, and late age of onset of rheumatic fever, only the last seemed to be a statistically valid factor in determining long life with rheumatic heart disease.

The mean duration of diminished cardiac reserve in 51 patients was 12.2 years; the mean duration of life after the first bout of congestive heart failure was 7.9 years. Therefore, the disease should be suspected in elderly patients when cardiac disability persists over a period of years.

The high incidence (40%) of missed diagnoses in the group of 20 patients that came to necropsy suggests that the incidence of rheumatic heart disease in the aged is far greater than available data indicate.

FAILURE OF TONSILLECTOMY

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Tonsillectomy is the commonest surgical operation, constituting about one-fourth of all operations performed. It is the operation that is done by more different physicians than any other. It is not usually a successful operation, however, because residual tonsil tags were found in 68% of 1,000 tonsillectomized patients. Better results can be achieved by improvement of the technique of the operation.

THE STUDY

One thousand patients were observed consecutively without selection in a general surgical practice over a period of years. Every patient who had had a tonsillectomy was interrogated and examined. They were asked (1) their age, (2) the age at tonsillectomy, (3) where the operation was done, (4) whether the surgeon was a "nose and throat" specialist, (5) why the operation was performed, (6) what anesthetic was used, (7) whether any benefit was obtained, and (8) whether to their knowledge any tonsillar tissue was left. Then the pharnyx was carefully examined with the use of a good light, a metal tongue depressor, and a tonsil pillar retractor. The tonsil tags were recorded as grade one to four, grade one being the smallest and grade four being an amount comparable to a normal size tonsil. The presence of lymphoid tissue not identifiable as tonsil tissue was also recorded.

THE RESULTS

Sixty-three per cent of the 1,000 patients were women. The average age was 36; the average age at operation was 19. Sixty patients had had two operations, and three had had three tonsillectomies. Only 240 thought that their surgeon was a specialist. Geographically the operations were performed mostly in the Pacific Northwest and near Texas. Sixty per cent of the operations were done with the patients under general anesthesia. Nineteen per cent thought their tonsils had been removed to improve their general health, and the other 81% because of local throat disorders. Thirty-one per cent denied any beneficial effect from the operation. Forty-two per cent of those expecting to have their general health improved denied receiving any benefit. Among those denying benefit, the incidence of retained tonsil tags was no greater than among those claiming benefit from the operation. The indications for tonsillectomy as revealed by this group of patients were very broad. This part of the study, of course, is largely subjective and probably is merely interesting and not valid scientific evidence justifying any conclusion regarding tonsillectomy.

Objectively, 68% of the patients had tonsil remnants, and only 32% had had a complete tonsillectomy. Of the 2,000 tonsil fossae examined, 1,120, or 56%, had tonsil tags. Forty-nine per cent of these tags were grade one, 29% were grade two, 14% were grade three, and in 8% the remnants were as large as a normal tonsil (grade four). Thirty-three per cent of the 1,000 patients had lymphoid tissue not identifiable as tonsil tissue. Among the 32% with no tags, some lymphoid tissue was found in the tonsillectomy scar area in 26%. Only 20% of the patients had throats that were absolutely clear of all lymphoid tissue in the palatine tonsil area. Only 20% of the patients with tags were aware of their existence. One per cent of those with clean throats thought they still had some retained tonsil tissue. Among the 400 patients who had had a local anesthetic, only 59% had tags. This would appear to be a significant difference in favor of a local anesthetic but may merely reflect the comparative ease of operative procedure in the larger throats of an older age group. Among those who believed their surgeon was a specialist, 64% had retained tags, a percentage that is not impressively better than the general average.

THE LITERATURE

These results are consistent with other similar studies. Gooch and Lillie [1] of the Mayo Clinic have recently published an excellent study of tonsil tags. They found an incidence of 22% of tonsil tags among the patients who had had a tonsillectomy prior to registration at the clinic. Sputh and Sputh [2] reported an incidence of 80% of tags among 285 patients. Kaiser [3] found an incidence of 38% in 1,000 school children. He also observed the incidence of otitis media, sore throats, and other diseases commonly associated with chronically infected tonsils to be increased in those with incomplete operations. His classic work is the only study found of the effect of tonsillectomy that considered the factor of incomplete operation.

Read before the Annual Meeting of the Oregon State Medical Society, Gearheart, Ore., Sept. 27-29, 1950.

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[2] Sputh, C. B., Jr., and Sputh, C. B.: The Tonsil Stump and Its Removal, J. Indiana M. A. 39:401 (Aug.) 1946.

[3] Kaiser, A. D.: Results of Tonsillectomy, J. A. M. A. 95:837 (Sept. 20) 1930.

Lüscher[4] noted an incidence of 22% in 224 patients he had operated on himself. Campbell[5] observed an incidence of 77% in 631 tonsillectomized university students. McLaggan[6] reported an incidence of 49% in 100 school children. He titled his article "A Plea for More Careful Tonsillectomy." Rhoads and Dick[7] found an incidence of 73% among a group of 403 nurses. Clark[8] in 1913 reported 43% among 143 patients operated on at the Massachusetts General Hospital. Coues[9] reported in 1910 an incidence of 30% in 40 school children.

The variation in the percentage of tags found by the various reporters is probably due to variation in the criteria for identification of a tonsil tag. Gooch and Lillie[1] reported that otolaryngologists found half again as many tags in a given group of clinic patients as had the general diagnosticians. McLaggan only considered fragments as large as one-fourth of the tonsil. Most reporters did not discuss their criteria. In this study the presence of a crypt in a mass of lymphoid tissue in the tonsillectomy scar area was taken as the identifying characteristic of tonsil tissue. The single characteristic that distinguishes the palatine tonsil from the other lymphoid tissue of the pharynx is the crypt. Lymphoid tissue of the adenoid or lingual regions does not contain crypts. Inflammation often facilitates identification by accentuation of the crypt. It is probable that some of the patients reported to have lymphoid tissue actually had tonsillar remnants. None of the other reporters distinguished between lymphoid tissue and tonsil remnants.

The patients themselves usually assumed that their tonsils had "grown back." I have never observed any such regrowth. Most of those who have studied the problem agree that tonsils do not recur.[10] Some[11] have remonstrated that all the extra capsular lymphoid tissue of the tonsil area cannot possibly always be removed. It is probably true that there is commonly considerable extra capsular lymphoid tissue. This peritonsillar lymphoid tissue probably is not tonsil tissue.[12] However, my own careful dissections have demonstrated the frequent existence of irregular rounded lobules of tonsil 2 to 20 mm. in diameter extending out beyond the so-called capsule into the peritonsillar tissue. These parts of the tonsil can easily be left in place by rough, careless dissection. Some tags probably represent such lobules left in place. Most of the tags are at the top or bottom of the tonsil and are plainly bits of the visible tonsil not disturbed by crude dissection with blunt instruments and snares.

THE TECHNIQUE

The operation of tonsillectomy for some obscure reason, probably based in antiquity when the tonsil was removed with the fingers without anesthesia, commonly seems to be considered in a category all by itself. Apparently it is immune to the considerations that govern other surgical procedures, such as good exposure, meticulous hemostasis, and careful dissection. Most physicians who remove tonsils are enthusiastic about their operation whenever they are given an opportunity to describe their method. Usually the enthusiasm is for the "slick," "easy," or "quick" method they have adopted. An occasional exception is the competent surgeon who usually admits he finds the operation difficult and time consuming. The 680 patients with tags probably were subjected to a great variety of operative methods, all of which had one thing in common: failure to remove all the tonsil. Certainly a fair test of an operation is that it should accomplish what it intends to do, and such a high incidence of tags following tonsillectomy is *ipso facto* evidence of failure. Irrespective of any consideration of the indications for tonsillectomy and its possible benefits, if the operation is to be done, it is reasonable to expect that the tonsil shall be removed. Most of the justifications for tonsillectomy must be based on complete removal.

It should be legitimate to compare tonsillectomy with the operation for excision of a branchial cleft cyst commonly situated nearby, for example, 1 cm. closer to the skin. They are usually approached with different attitudes however. The difference is that complete excision of the branchial cleft cyst is assumed as a matter of course, whereas portions of the tonsil are usually left in situ. For instance, no surgeon would think of using a snare on a branchial cleft cyst.

Tonsillectomy has certain inherent factors that make it a very difficult operation. The exposure is limited by the size of the mouth, and one cannot improve the exposure by getting an interne to hold a retractor. Illumination can only come from one direction. Hemostasis is difficult because of the small size and depth of the avenue of approach. It is necessary to use long clamps and tie knots at finger tip depth. Moreover the usual position of the patient during operation causes the blood to collect in a pool at the line of dissection. Often the blood runs down the throat causing the patient to gag and cough or arousing apprehension of pulmonary complications.

None of these inherent factors is insurmountable if the surgeon is determined to remove all the tonsil and is willing to take the time and pains to do it by applying the usual standards of any good operation. The position of the patient can be made to facilitate the operation rather than hinder it. For the patient under general anesthetic, the Davis type of mouth gag allows the head to hang inverted over the end of the operating table. The surgeon sits in front of the open mouth. The blood of any uncontrolled bleeding runs down into the nasopharynx and out the nose. The head mirror provides the best illumination, after the surgeon acquires the skill to use it. Intratracheal intubation is sometimes desirable for older patients with stiff necks. One begins the dissection with a sharp knife by outlining the tonsil, including all visible tonsil tissue, especially at the junction of the tonsil and tongue. The tonsil edge is grasped with a tenaculum at the lowest part, which anatomically is designated the superior pole. The dissection proceeds upward and backward by sharp snips with scissors. The line of dissection is always clear, because the blood runs downward and away from it. Spurting arterial bleeding may occasionally jet upward to obscure the line of dissection, and such bleeding is controlled by clamp and tie as in any other operation. The clamp can be applied and left dangling until the dissection is complete. The Sten clamp with the jaws curved at 45 degrees seems most convenient. The tie is made with a 20 in. strand of no. 20 crochet cotton thread. No assistant is necessary. The dissection by scissors is carried completely through to the base of the tongue. No snare is used. There is no reason for one end of the tonsil being dissected any differently from the other end. In fact, the inferior (lingual) pole, which is so often "dissected" by a snare, is more apt to have irregular lobules which require the most careful dissection by scissors for clean removal.

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[11] Leshin, N., and Pearlman, S. J.: Are Tonsillar Recurrences Entirely Due to Faulty Operative Technique? Arch. Otolaryng. **13**: 37 (Jan.) 1931.

[12] Baum, H. L.: Complications and Sequelae of Tonsil and Adenoid Operations, Ann. Otol., Rhin. & Laryng. **28**: **37** (March) 1919.

The patient under local anesthetic is seated on an operating table, which is arranged with the foot down and the back up to form a chair. The "knee strap" is tightened across the lap so the patient can lean forward against it. The table is raised to full height. The surgeon sits in front of the patient, who leans forward so the mouth opens downward. The lamp for the head mirror is above the patient, and the surgeon looks upward into the patient's mouth. Blood and saliva drain downward and out of the mouth rather than into the pharynx. After anesthetic infiltration, the dissection is begun by an incision as above described, all the tonsil tissue being outlined. The tenaculum grasps the tonsil at the lower anterior part, at the junction of the anterior pillar and the tongue. The dissection proceeds upward and backward with no opportunity for the blood to collect in a pool at the line of dissection. In this position, each tonsil can usually be removed without the patient's coughing or gagging, except for an occasional spurting artery which may jet across into the pharynx.

RESULTS OF OPERATIVE PROCEDURE

Two hundred sixty-two patients have been operated on in such a manner with a purposeful effort to remove all the tonsil and have been observed six months or more later. The throats of 48 patients (18%) showed some lymphoid tissue in the tonsil area, but in only two of them could the lymphoid tissue be identified as a remnant of tonsil.

SUMMARY

The operation of tonsillectomy as ordinarily performed is considered to be a failure as evidenced by 68% of tonsil tags in a group of 1,000 tonsillectomized patients. Careful dissection, which is facilitated by described technical methods, especially the position of the patient, has been successful in 99% of 262 patients.

The Dalles.

PROBLEMS OF THE GERIATRIC ASTHMATIC AND THEIR CLINICAL MANAGEMENT

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It has been truly said by Stieglitz [1] that old age begins at birth and can be terminated only with death and also that aging is part of living. The recent interest in the study of older or aged people has created the specialty of medicine known as geriatrics, which concerns itself with the physiologic, pathologic, and clinical problems of the elderly. Its need has been stimulated by the remarkable recent increase in the number of older people, brought about largely by the prolonged life span resulting from advances in preventive medicine and therapeutics. As a consequence, many more people now live to 65 or 70 or older and physicians, therefore, must treat many more older people than formerly.

Geriatrics, in a sense, is the converse, or mirror image, of pediatrics and in certain respects is confronted with similar problems. Thus, for example, just as infancy is a critical period in pediatrics, so too is the period of later maturity (between 40 and 60) a critical one for the geriatric patient because of the greater incidence of progressive and degenerative diseases; and since such a patient is an adult growing older, he is also subject to the same diseases and conditions as when younger. Geriatrics therefore embraces many different specialties of medicine: Allergy can and does affect the older person and there is no good reason for assuming that it should not. Hay fever, urticaria, asthma, or atopic dermatitis can begin in people past 40, although less frequently than in younger persons. Asthma, for example, may begin in a person past the age of 75.[2] Recently I saw a 77-year-old patient with typical allergic bronchial asthma which began at the age of 74 and which responded satisfactorily to the usual allergy treatment. For some time, it has been generally considered that allergic conditions rarely begin in senescence or senility and that when they do arise at that time other factors must be operative. This was especially true for asthma. Thus, according to Alexander,[3] asthma is a disease of early decades. He cites the statistics of Coke,[4] who in 1927 found only 20 patients, or 2% of a series of 1,000 asthmatics, to be over 60. The only comparable statistics available at present are those of Rowe and Rowe [5] in 1947. While

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[1] Stieglitz, E. J.: Geriatric Medicine: The Care of the Aging and the Aged, ed. 2, *Philadelphia, W. B. Saunders Company, 1949.*

[2] This period is designated by Stieglitz as "senility," in contrast to "senescence," which is between 60 and 75.

[3] Alexander, H. L.: Bronchial Asthma: Its Diagnosis and Treatment, *Philadelphia*, Lea & Febiger, 1928.

[4] Coke, F.: Review of 1,000 Cases of Asthma, Brit. M. J. 1: 955, 1927.

[5] Rowe, A. H., and Rowe, A., Jr.: Bronchial Asthma in Patients over the Age of 55 Years: Diagnosis and Treatment, Ann. Allergy 5: 509, 1947.

these authors did not particularly compute the incidence of asthma in older persons, they mention in their article that of a total of 1,232 private patients there were 72 whose asthma began after 50. This is an incidence of 5.85% and undoubtedly would be higher if only those whose asthma began after 40 were included. Likewise, Fuchs[6] in 1947 reported that, of 200 asthmatics studied, the age of onset at the initial attack was given as past 50 in 27, or 13.5%. This increase in incidence may occur because people are living longer or because physicians are seeing more of them. Despite this, however, some older ideas concerning incidence and etiology in the geriatric asthmatic still prevail, at least as judged by a review of current books and of the sparse literature on geriatrics. It seems worthwhile, therefore, to review this subject, discussing in particular questions of etiology, differential diagnosis, and clinical management. Discussion will concern those patients whose asthma began after midlife and not those who are past 40 and have asthma regardless of when it began. If a patient of 50 has had asthma since he was 20 or 25, the problem of etiology, diagnosis, and management may be quite different from that of a patient of the same age with asthma of only one or two years' duration. Recent articles on this subject by Cueva[7] and by Rowe and Rowe[5] refer to patients past 50 who have asthma regardless of when it started. While their reports are helpful regarding incidence, complications, allergic aspects, etc., they do not differentiate between asthma beginning in the geriatric patient and that beginning before 40.

ETIOLOGY

In the etiology of asthma in the geriatric patient, as contrasted with the younger patient, a difference is observed in the importance of the factor of heredity. Cooke and Vander Veer[8] showed that the significance of hereditary predisposition to asthma decreased progressively after the age of 20. This seems to be verified by clinical experience. Thus, for example, asthma in older people usually is not accompanied with such marked sensitivity to specific allergens as in younger persons, nor is it associated so often with other atopic manifestations such as hay fever, migraine, or eczema. Furthermore, attacks in the geriatric generally are milder, with less tendency toward the explosive acute reactions seen in younger asthmatics, especially in those with strong atopic backgrounds.

Since heredity is not important in predisposing the older person to asthma, the initial attacks may result either from acquired sensitization to inhalants, foods, drugs, or bacterial allergens or from internal causes (endocrine or psychosomatic); the asthma thus provoked may well be the starting point for a new line of allergic offspring in subsequent generations. Undoubtedly older as well as younger persons can be sensitized to inhalant allergens, as, for example, to various occupational dusts. But the extent of exposure required is an undetermined variable which probably depends upon such factors as tissue or cell reactivity, about which relatively little is known. Nevertheless, asthma may be acquired by older persons by contact with environmental allergens; and, as a corollary, exposure to such contacts may be a potent factor in the development of the asthma.

Development of allergy to foods by older persons from continued exposure is less likely than is the case with inhalants. Experience with children has shown that continual ingestion of allergenic foods will sometimes bring about sufficient improvement in tolerance to enable them to eat these foods in average or larger amounts. Therefore, except in exquisitely sensitive patients, many food allergies will be overcome during maturity. Whether allergies to new foods or overindulgence in foods to which they formerly were allergic may be responsible for the food allergy in these persons is difficult to ascertain. Opinion is divided chiefly because most of the evidence is based upon the results of skin tests rather than diet trial. Nevertheless, clinical experience indicates that food allergy may be important in some geriatric asthmatics and its disregard may explain some treatment failures.

Despite these variations, the development of asthma in the geriatric patient and the mechanism of reaction are essentially similar to those of the younger person with one important difference. It has been emphasized unduly by some authors, leading to considerable misconception of the origin of the asthma and often to unnecessary treatment. This is the idea to be found in some textbooks on geriatrics,[9] and also in the publications of some allergists to the effect that asthma developing past midlife is almost always intrinsic or infectious in origin. This thought is so firmly entrenched in the minds of many that if a patient past midlife presents himself with asthma of fairly recent orgin it is assumed at once that the asthma is of infectious or intrinsic origin. For example, Rackemann in a recent article[10] concludes that asthma beginning after age 40 is not often due to allergy but is caused by something which the patient carries with him at all times. He considers infections in the respiratory tract, either primary or secondary, highly important; also, more general disturbances of the whole body, especially emotional or psychosomatic factors, in addition to physical disturbances such as focal infections, malnutrition, or poor general health from any cause. He bases these conclusions, especially as to the psychosomatic factors, upon the results of psychotherapeutic treatment, including reassurance to allay fear, and also upon the fact that "death from asthma can occur from nothing more than emotional strain."

These statements are subject to challenge since they are contrary to the clinical experience of many others. As I pointed out several years ago,[11] the term "intrinsic" or "infectious" asthma often is used when the cause of the asthma is unknown. It should be replaced by the more descriptive term "idiopathic," which describes the situation more accurately. Regardless of these considerations, however, it is difficult to understand why asthma in a patient past 40 must necessarily be regarded as infectious in origin. What it is that makes 40 or 50 or any age the dividing line between infectious and noninfectious asthma is difficult to comprehend.

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[6] Fuchs, A. M.: Allergy Problems in Elderly Persons, Geriatrics 2:235, 1947.

[7] Cueva, J.: Asma Bronquial en Geriatria, Rev. mex. de alerg. 1:5, 1950.

[8] Cooke, R. A., and Vander Veer, A., Jr.: Human Sensitization, J. Immunol. 1:201, 1916.

[9] Thewlis, M. W.: The Care of the Aged (Geriatrics), ed. 3, St. Louis, C. V. Mosby Company, 1941. Boas, E. P.: Treatment of Patient Past Fifty, Chicago, The Year Book Publishers, Inc., 1941.

[10] Rackemann, F. M.: Other Factors Besides Allergy in Asthma, J. A. M. A. 142:534 (Feb. 25) 1950.

[11] Tuft, L.: Bronchial Asthma: A Critical Review, J. Allergy 17:27, 1946.

Hay fever and other forms of allergy can and do begin in persons in the sixth, seventh or eighth decades; why should not asthma of nonbacterial origin? Infections generally occur more frequently in young children than in adults; yet it is agreed that "infectious asthma" is less frequent in children than in older persons. Why, then, assume that asthma beginning in the geriatric necessarily must be infectious?

One explanation may be that positive skin reactions are less frequently seen than in younger persons. This is partly true, if only moderate or marked positive reactions are considered. But since skin reactivity is lessened in older persons, doubtful or slight reactions may be as significant as larger reactions in younger persons. This is even truer of foods, for, as in younger asthmatics, skin reactions may be negative despite the existence of proved clinical food allergy.[5]

Another reason for assuming the infectious nature of asthma in older persons is the presence of evidence of sinus disease (chiefly revealed by x-ray) or of a history of frequent "colds." The fallacy of the former is obvious, since various studies, especially those of Bullen [12] and of Kern and Schenck,[13] have shown that the presence of sinus disease as determined solely by x-ray examination cannot be taken either as a reliable index of infection or as proof that the asthma is infectious. This is true also of the history of repeated "colds." These often actually represent attacks of allergic rhinitis which are mistaken for colds. Many patients with asthma beginning in later life have a history of long-standing recurrent nasal difficulties which upon detailed history and examination prove to be allergic rhinitis. Sometimes the nasal symptoms extend as far back as early maturity or even into childhood and recur only at intervals thereafter or persist in varying degree until the onset of asthma in later years. Not infrequently these patients give histories either of various nasal operations or of recurring nasal polyps, the removal of which provided relief for varying periods. Detailed inquiry into the history often will furnish ample evidence that the asthma was preceded for months or years by an unrecognized allergic seasonal or perennial rhinitis of varying severity. When seasonal, and especially in patients with hay fever of long duration or starting in later life, the initial complicating asthmatic attack may develop in the geriatric period.

It may be concluded, therefore, that there is insufficient evidence to show that asthma in the geriatric patient is necessarily or frequently infectious in origin. Inhalants such as house dust, feathers, pollens, and molds can be important offenders, since many patients with asthma of recent duration improve remarkably after change of environment. Recently a 68-year-old patient with asthma of two years' duration entered the hospital. Within 24 hours after admission, and without treatment, the asthma cleared up spontaneously. He changed residences and remained symptom-free even after his discharge 14 days later, except when he returned for a short stay at his former farm residence. The asthma here, as in other similar patients, undoubtedly was due to environmental factors like those affecting younger asthmatics. Such occurrences prove that asthma due to environmental allergens such as dust or animal danders can affect a person of 70 or more just as it does one of 20. There is little reason for assuming that the asthma is infectious merely because the patient is old.

The importance of allergy to foods already has been emphasized and should be considered in all patients. While opinion as to its incidence may vary, nevertheless, unless an attempt is made to carry out adequate diet trial, it cannot be said categorically that food allergy in the older patient is relatively infrequent. Remarkable benefit sometimes follows the institution of dietary restrictions or trial as in the following case:

Case 1.—A man, aged 62, with asthma present acutely for 10 months, previously had often been subject to so-called colds and mild coughing attacks occuring mostly in the fall. He had previously been studied in another hospital because of what was believed to be bronchitis and bronchiectasis, both of which were considered upon an infectious basis. He had had a tonsillectomy during his previous hospitalization because of that possibility.

When first seen, the patient was acutely asthmatic and showed some emphysema; otherwise the examination was noncontributory. Immediate hospitalization was refused by the patient, who asked for a delay of a week or two. In the meantime, an allergy diet and also aminophylline by mouth were prescribed Iodides were not used because there was a history of an iodide rash. When he returned a week later, there was striking improvement, with little or no audible wheezing. This persisted throughout the course of his allergy studies and for the two-year period during which he was observed thereafter. He was found to be particularly susceptible to attacks after contact with cooking odors, especially from fish or bacon, or contact with house dust. He was instructed to avoid these and was also given small doses of house dust extract for purposes of desensitization.

This case illustrates the beneficial effects of an allergy diet plus symptomatic measures in a patient with severe asthma previously considered to be upon an "infectious" basis. It might be argued—and with some justification—that the striking relief which followed was not necessarily the result of diet alone, since the patient was receiving aminophylline by mouth at the same time. However, his response was so similar to that of others who were given a diet alone that one is forced to conclude that the dietary restriction or exclusion must be important in such patients. Regardless of these considerations, his striking improvement under allergy treatment, coupled with his clinical reactions to exposure to dust or to cooking odors or cold weather, so closely resembles that of the younger allergic asthmatic as to contradict effectively the original opinion that this was an infectious asthma.

Another etiologic factor considered important in geriatric asthma and believed to contribute to its intrinsic quality is a disturbance of the endocrines, especially in women. Recent work with the pituitary and adrenal hormones has shown that these may have profound influences upon asthma. But we do not know as yet whether disturbances or dysfunction of these glands may be etiologically responsible for asthmatic attacks and, if so, whether this is more prevalent in older persons. The idea that asthma in women lessens after the menopause is not substantiated by clinical experience; it gets worse in some women instead of better. Proof of the existence of an "intrinsic factor" of endocrine origin as a cause of geriatric asthma therefore still awaits confirmation.

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[12] Bullen, S. S.: Incidence of Asthma in 400 Cases of Chronic Sinusitis, J. Allergy **4**: 402, 1933.

[13] Kern, R. A., and Schenck, H. P.: Relative Efficiency of Clinical and Roentgenologic Methods for Sinus Diseases Diagnosis, with Observations on Incidence of Sinus Disease: Based on Findings in 200 Asthmatics and 50 So-Called "Normals," Am. J. M. Sc. **178**: 168, 1929.

With minor variations, the specific etiologic agents responsible for asthma are essentially the same in the geriatric patient as in younger persons. If this were always remembered, the approach to etiologic diagnosis and to specific treatment in these patients would be the same as though the asthma were affecting a person of 20 instead of 60 or 70.

DIFFERENTIAL DIAGNOSIS

In the differential diagnosis of asthma in the geriatric patient, the age of the patient brings up diagnostic problems which seldom arise in children or younger adults. When an elderly patient presents himself complaining of dyspnea associated with a wheezing respiration, it must first be determined whether the condition is bronchial asthma or a condition resembling it. The dictum of Chevalier Jackson that "all is not asthma that wheezes" applies not only to foreign bodies, especially in children, but also to other obstructive chest lesions such as mediastinal tumors of neoplastic, aneurysmal, or lymphatic origin, which may give rise to similar signs and symptoms. Such tumors usually are distinguishable by the presence of associated laryngeal symptoms (stridor or hoarseness) or of unilateral wheezing, and x-ray evidence of this pathology is distinctive enough to establish the diagnosis with certainty. Pulmonary neoplasms are more difficult to diagnose, especially when associated with typical asthmatic symptoms, because it is not easy to say whether the asthma has been provoked by the neoplastic process or whether the neoplasm exists independently of the asthma. Recently I saw a 76-year-old man with typical symptoms and signs of acute asthma of three weeks' duration and with a proved bronchogenic carcinoma which resulted in his death two months later. Except for the small shadow seen fluoroscopically in the left chest the neoplastic process might have been missed, since the only symptoms and physical signs were those of acute asthma. This emphasizes the necessity for x-ray examination of the chest in all asthmatics, especially older persons, so as not to miss an early pulmonary cancer.

Another condition offering diagnostic difficulties in the geriatric asthmatic is hypertensive cardiovascular disease, particularly so-called cardiac asthma. This term is used to designate a paroxysmal type of wheezing dyspnea, usually nocturnal, which affects those people past midlife with hypertensive cardiovascular disease. It is believed to be due to a sudden relative failure of the left ventricle in a patient whose right ventricle is functionally normal. This sudden failure produces, in turn, acute pulmonary hypertension, secondary intense pulmonary emphysema, and pulmonary edema. Often there is associated precordial pain or oppression of the anginal or coronary type. During the acute attack the condition so closely resembles bronchial asthma that it may be difficult to distinguish the two conditions by examination alone. But because the patient is elderly and has had the asthmatic symptoms for a relatively short time, as well as the presence of hypertension, left-sided cardiac enlargement in varying degrees, cardiac murmurs, and evidence of impairment of conductivity in the electrocardiogram, differential diagnosis between cardiac and bronchial asthma is fairly easy. Unfortunately, however, the history and physical findings are not always typical. My experience and that of our cardiologists indicate that true cardiac asthma is relatively uncommon. Its diagnosis is made more frequently than is warranted, especially in those patients who have nocturnal asthma with mild or moderate degrees of hypertension and no significant cardiac signs. In this situation, it is not always easy to decide whether one is dealing with bronchial asthma in a patient who happens to be hypertensive or whether the asthma is the result of the cardiac lesion. If the asthma has been present for several years and there is definite evidence of allergic sensitization either in the history or from allergy studies, the diagnosis of allergic bronchial asthma is easily established. The allergist frequently sees patients past midlife, especially women, with typical allergic bronchial asthma and a coincident benign essential hypertension. Continued observation of such patients, at least in my experience, shows that the two conditions are entirely unrelated etiologically and should be managed as though they existed independently.

In patients with allergic bronchial asthma of varying duration hypertensive organic cardiac disease or coronary accidents may develop. These have no etiologic relationship to asthma, but they make treatment more difficult, as exemplified in the following case report.

Case 2.—A man aged 75, was first seen in 1939 with bronchial asthma of three years' duration. The allergic character of the asthma was estabished by a history of attacks of perennial allergic rhinitis preceding the asthma, the presence of urticaria, and specific positive skin test reactions. Despite a blood pressure reading of 170/90, the heart showed no changes at that time. Striking improvement followed allergy treatment, especially after elimination of some very old feather pillows, plus symptomatic treatment and a short course of injections of house dust extract. He remained fairly comfortable for five years without additional or specific treatment until 1944, when at the age of 80 cough, dyspnea, and precordial pain radiating down the left arm developed. Examination showed persistence of hypertension (170/90) and also signs of cardiac insufficiency. Electrocardiograms verified the presence of coronary artery disease. He was treated for the cardiac condition and despite his age improved gradually for a while. He died of cardiac failure three years later at the age of 83.

This case is remarkable from many standpoints, but it illustrates particularly the fact that coronary disease and its aftermaths can affect patients with allergic bronchial asthma without having any etiologic relation to the asthma. Designation of asthma in such a patient as "cardiac" is erroneous and could be avoided if the differentiation between true cardiac asthma and bronchial asthma were kept in mind. This also would eliminate the custom of applying the term "cardiac asthma" to attacks of dyspnea associated with cardiac decompensation or failure. Such usage is incorrect, since neither is the dyspnea periodic nor is it associated with wheezing respiration; it should be designated cardiac dyspnea, not cardiac asthma. When asthma affects patients with such organic cardiac lesions as mitral stenosis, the relationship is likely to be coincidental rather than etiologic. In such circumstances, the wheezing respiration disappears when decompensation sets in and reappears when compensation is restored.

This brings up for consideration those pulmonary conditions in the geriatric which may simulate asthma. An outstanding example is the chronic bronchitis which, usually associated with chronic emphysema, affects older people. Examination of the chest reveals numerous sibilant and sonorous rales and even a wheezing type of respiration but there is neither paroxysmal dyspnea nor any other of the signs that characterize the acute asthmatic attack. This form often is called asthmatic bronchitis or asthmatoid bronchitis.

Opinions differ as to whether asthmatic bronchitis is a form of asthma due primarily to bacterial sensitivity or, as seems more likely, whether it is entirely secondary to an infection or irritation of the bronchial tubes which causes sufficient bronchial obstruction to produce a mild asthmatic wheeze, perhaps in a predisposed subject. The wheezing usually is secondary to the cough and is more or less continual and not paroxysmal as in true asthma. Patients with asthmatic bronchitis have little or no difficulty in sleeping in a flat position at night, in contrast to the orthopnea of those with paroxysmal or acute attacks of asthma.

Although chronic bronchitis may be due to various causes, a condition frequently responsible for wheezing respiration is pneumonoconiosis, especially the form known as "miners' asthma" (anthracosis). Such patients, after long-continued exposure (more than 12 years) to coal dust, begin to show evidence of bronchial irritation. The frequent more or less continuous attacks of bronchitis are followed by dyspnea upon exertion, with or without wheezing respiration. The latter is the last to appear and is often mild compared with the cough and expectoration. At this stage, emphysema, bronchiectasis, or pulmonary fibrosis are evident. A history of exposure to occupational dust as well as the presence of bronchitis for a long time before the onset of wheezing, together with the physical and x-ray findings, usually are sufficient to differentiate the wheezing of pneumoconiosis from that of true allergic asthma.

Presence of wheezing dyspnea in persons past middle life, usually with moderate or marked emphysema; predominance of protracted cough accompanied with little or no dyspnea in spite of signs of wheezing in the chest; presence of mucopurulent sputum, and absence of any evidence of allergy either in the history or by special examination are all of differential diagnostic importance. They serve also to distinguish asthmatic bronchitis from the bronchitis present during or at the end of an attack of allergic asthma.

Although these conditions always have been considered as instances of primary chronic bronchitis with secondary asthmatic symptoms or as nonallergic asthmas, it is not unlikely that the asthmatic wheezing associated at times with certain obstructive or nonobstructive chest conditions (e. g., neoplasm, "cardiac asthma," etc.) is not due to any direct influence of the original causative lesion. These patients may possess in their bronchi what might be called an asthmogenic tendency, which lies dormant perhaps for years until activated by a lesion such as neoplasm, tuberculosis, cardiac disease, or pneumonoconiosis. These processes then act as triggers to set off the dormant asthmatic tendency. It seems difficult otherwise to explain why, of the many patients with pulmonary neoplasm or hypertensive coronary disease, relatively few have asthmatic wheezing as a prominent symptom or why, of the many miners with chronic bronchitis and emphysema, relatively few contract miners' asthma. The development of asthma in such patients must depend upon some factor other than the associated pulmonary or cardiac lesion. Recently, for example, I saw a mine inspector, aged 50, with asthma of three years' duration whose father had miners' asthma. X-ray examination showed some associated emphysema but little fibrosis. He has responded very well thus far to allergy treatment similar to that given younger asthmatics. Fortunately he did not have much exposure to coal dust; otherwise, he surely would have had miners' asthma as his father did. Tissue predisposition must be important in such patients, despite an apparently negative atopic family history.

Differential diagnosis is of primary importance in the geriatric asthmatic. Detailed history and thorough physical examination, especially of the lungs and cardiovascular system, are paramount. Competent x-ray examination of the entire chest cavity should be a routine procedure in all these patients and, whenever necessary, such special cardiologic examinations as electrocardiography, determination of circulation time, etc. These should make it possible to arrive at the proper diagnosis and to distinguish true allergic bronchial asthma from the nonallergic asthmas, including so-called asthmatic bronchitis and cardiac asthma. The diagnosis is established more definitely by the presence of increased numbers of eosinophils in the blood and the nasal and bronchial secretions; a history of associated allergic conditions such as allergic rhinitis, migraine, urticaria, etc. and specific positive skin reactions.

TREATMENT

When the diagnosis of allergic asthma has been made, the patient should be managed as though he were 20 or 30 instead of 50 or 60. Attempts should be made to determine the specific allergen or allergens by history, allergic tests, and clinical diet trial. It should be kept in mind that the skin of the geriatric is less reactive than that of younger persons and that positive reactions of even doubtful or slight degree should be considered important until proved otherwise. Diet trial should be carried out whenever food allergy is suspected. But it must be remembered that the nutritional state in the old as in the very young can be greatly impaired by severe or prolonged dietary restriction unless proper precautions are observed. Provision should be made for adequate caloric intake and for supplemental vitamins and minerals. Diet trial often will improve the condition of such patients, especially those previously thought to have "infectious" or "intrinsic" asthma.

As stated above, there is no proof that infection, especially in the paranasal sinuses, is the most important cause of asthma in the geriatric patient. Care is therefore needed in choosing treatment for these patients, even when there is x-ray evidence of sinus infection. I once had an elderly asthmatic patient who, though his condition was much improved with conservative allergy treatment, was discouraged by the persistence of mild attacks. A radical sinus operation was advised by his otolaryngologist, who had treated him for a long time for nasal difficulties. While I was not at all certain it was essential, I made no effort to interfere. The patient died from a complicating pneumonia a week after the operation. Since then, unusual caution has been exercised with these patients; furthermore, such procedures are seldom advocated except when purulent infection that does not respond to ordinary drainage and treatment exists. As nearly as can be judged from the reports in the literature,[14] as well as from subsequent clinical experience, the results of conservative treatment are just as good as, if not better than, those of radical sinus surgery. Conservatism in treatment is the keynote of success in all geriatric asthmatics.

The treatment of asthma in the aged is generally the same as in younger persons—elimination or avoidance of the offending allergens, or desensitization when the former is not possible. As in young children, due care should be exercised in administering extracts of dust, pollens, molds, or bacterial vaccines to avoid constitutional reactions, which may upset older patients more than younger persons. We sometimes see older asthmatics who previously received large doses of vaccines or dust extracts and who seem to get well even faster than younger and previously untreated asthmatics with only simple symptomatic treatment. The improvement in these patients probably is due largely to discontinuance of the injections of extracts in a dosage which did more harm than good. When in doubt, saline injections should be substituted for several weeks. If improvement follows, it is certain that the allergenic extract was causing reactions. The dosage then either is modified accordingly or the injections are discontinued entirely. Except for these precautions, the specific desensitization procedures are the same in the geriatric as in younger patients.

More care should be exercised, however, in the use of nonspecific methods of desensitization, especially in relation to fever therapy provoked by intravenous injections of typhoid or colon bacilli. The vascular systems of the aged naturally will not withstand the shock of sudden reactions as easily as those of younger persons; unless these injections are given cautiously, severe untoward or even fatal reactions may follow. When in doubt, it is best to avoid them.

Regardless of cause, drug therapy for symptomatic relief is an essential part of treatment in the geriatric asthmatic. As a rule, the same drugs are employed for any asthmatic patient, regardless of age. Of all drugs used, potassium iodide is one of the mainstays in treatment. Given in doses of 10 or more grains (0.60 Gm. or more) three times daily it seems to have a particularly beneficial effect on the elderly asthmatic. Whether this is due alone to its liquefying effect on the sputum or to some peculiar alterative effect on the tissues of the aged as well is not known; nevertheless, it is very helpful during the subacute or chronic stages. Ephedrine or one of its synthetic substitutes may be given at the same time, but more care should be exercised in their use, especially in the older male patient with prostatic hypertrophy. Ephedrine has produced in some patients such vesical tenesmus that prostatic surgery was considered; when the symptoms disappeared afte the medication was discontinued, the urologist realized that the symptoms were being provoked by the ephedrine and operation was avoided. Therefore, if the ephedrine drugs are to be used in older patients, smaller doses should be employed than in younger adults.

Treatment of the acute asthmatic attack in the aged generally is like that in any other asthmatic. Epinephrine by injection or aerosol still is the mainstay, with aminophylline by mouth, rectum, or intravenous injection as a substitute or supplement when epinephrine either is ineffectual or cannot be used. The question whether to use epinephrine or aminophylline for the relief of the acute attack often arises in the geriatric because of the likelihood of hypertension. If the hypertension is benign or essential, epinephrine in small doses can be used without fear to relieve acute asthma. Practitioners often are afraid to use it in such circumstances because they feel the epinephrine might increase the blood pressure. In my experience, however, it does the opposite. The relief of the asthma afforded by epinephrine usually reduces the blood pressure, which had been elevated by the vascular strain induced by acute asthma. One should not hesitate, therefore, to use small doses of epinephrine for relief of acute attacks unless the patient shows definite evidence of organic cardiac disease, especially involving the coronary artery. In those circumstances, the drug of choice should be aminophylline, given either orally or rectally, or, in acute attacks, by intravenous injection. In the latter instance, it should be administered slowly and cautiously. The fatal reactions after intravenous injections of aminophylline reported by Merrill[15] in 1943 occurred mostly in asthmatics with severe organic cardiovascular disease and might have been due either to rapid administration or to the fact that these patients were *in extremis*. In such instances, aminophylline rectally should be tried first and, if ineffective, may then be given intravenously in smaller dosage. This is also the only instance in which morphine may be given justifiably to an asthmatic patient. Since morphine depresses the respiratory system, its use in other asthmatics is contraindicated. But if a diagnosis of cardiac asthma has been established, it then can be given with benefit. If in doubt, meperidine (demerol®) hydrochloride may be somewhat safer, although it too should not be used unless essential. The aged, like children, do not tolerate sedatives such as barbiturates or morphine drugs as well as do younger persons; hence more care is needed in their administration.

Two other remedies sometimes given to the geriatric patient, whether asthmatic or not, are digitalis and alcohol. The indications for their use are not always clear, nor is there certanty as to their value. Unless cardiac insufficiency exists, the efficacy of digitalis is doubtful. Alcoholic drinks are believed to be tonic and supportive to the older person. Unless there is clinical evidence that their imbibition aggravates the asthma, they may be useful adjuncts. Relief of mild attacks might be obtained by their moderate use.

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[14] Guerrant, J. L.; McCausland, A., and Swineford, O., Jr.: Asthma with Sinus Disease: Comparison of Radical Sinus Surgery and Conservative Treatment, J. Allergy **21:** 187, 1950.

[15] Merrill, G. A.: Aminophylline Deaths, J. A. M. A. **123:** 1115 (Dec. 25) 1943.

EMPHYSEMA

The most important complication of asthma in the geriatric is emphysema. This will be present in varying degrees depending upon the character and chronicity of the asthma. When asthma begins after 40 and recurs in the form of acute attacks, little emphysema probably will result. But if asthma becomes chronic and lasts for five years or more, emphysema of increasing severity will follow. It is especially troublesome in patients with asthmatic bronchitis in whom it is responsible for the annoying dyspnea accompanying the cough. Emphysema in these patients is due to more or less continuous overdistention of the pulmonary alveoli, leading to loss of elasticity of the connective tissue and its eventual destruction; it is much like an overstretched rubber band that fails to recoil. Increasing emphysema results in increasing reduction of pulmonary function, indicated by vital capacity or by bronchospirometric tests and clinically by increasing dyspnea. Little can be done to alter the status of a patient with permanent tissue changes indicated by a fixed chest wall. Nevertheless, some relief may be afforded by symptomatic measures to counteract the asthmatic wheezing, the cough, and the associated bronchial infection. In addition, some patients will derive benefit from the abdominal belt used in emphysema and perhaps from breathing exercises designed to improve diaphragmatic excursions or from a positive pressure-oxygen apparatus.

CONCLUSIONS

Asthma in geriatric patients usually has the same general characteristics, etiology, and clinical features as in younger people. However, the geriatric asthmatic differs in certain respects from the younger adult asthmatic, as does the asthmatic child. He also presents different diagnostic problems, especially those in connection with intrathoracic and cardiovascular conditions which require special attention and methods of diagnosis. Treatment, although generally the same in principle, also brings up special considerations and problems, as, for example, in the use of epinephrine, ephedrine, and aminophylline, which are of less moment in younger individuals. Conservatism *is the keynote to successful* treatment of the geriatric asthmatic. Properly utilized, these measures will enable the practitioner to attain the ideal goal of successful treatment in the geriatric patient, which should be to add life to his years as well as years to his life.

1530 Locust St. (2).

PHYSIOLOGICAL BASIS FOR PRESERVATION OF FECAL CONTINENCE AFTER RESECTION OF RECTUM

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Preservation of the anal sphincters in resection of the rectum can have but one aim, the retention of fecal continence. If this aim is to be realized, the mechanism by which fecal continence is normally maintained should be understood. The experimental work of McVay,[1] Gilchrist and David,[2] Glover and Waugh [3] and others [4] indicates that lymphatic metastasis from cancer of the rectum does not take place in a retrograde or distal direction until the proximal nodes lying in the mesosigmoid are largely blocked by malignant cells and the lymph stream thereby forced into collateral channels. On the basis of this work some surgeons have concluded that it is both safe and desirable to preserve the anal sphincters when resecting the rectum for malignancy. Other surgeons have violently disagreed with this view on the basis that the less radical, sphincter-preserving operation will result in fewer cures. The purpose of this paper is not to enter into a discussion of this controversial point but rather to summarize the physiological basis on which fecal continence is maintained. It seems obvious that if the anal sphincter is preserved, but its function lost, little or nothing has been accomplished.

TYPES OF FECAL CONTINENCE

Fecal continence may be defined as the ability to retain the contents of the colon until their expulsion is convenient. To understand how this is accomplished in normal persons, it is of the greatest importance to realize that fecal continence may be subdivided into reservoir continence (previously termed colonic continence) and sphincteric continence.

Reservoir Continence.—The left colon is fundamentally a reservoir organ and, like other smooth muscle reservoirs, automatically and without sensation adapts itself, up to a given point, to the bulk of its contents. When this bulk reaches a certain magnitude, peristalsis begins and the fecal mass is ejected. This ejection is beyond voluntary control. However, it is to be noted that feces are retained in the left colon for appreciable periods of time, 24 to 48 hr., and that freedom from colonic emptying over such periods constitutes a type of continence that has nothing to do with anal sphincters. Indeed, if the rectum and anal sphincters are entirely removed and a sigmoid colostomy established through the abdominal wall, this reservoir function of the colon can, by attention to diet and colonic irrigations at regular intervals, be utilized to produce a type of continence which experience has shown to be surprisingly satisfactory. For convenience, this has been termed reservoir continence, and it cannot be too strongly emphasized that it is retained whenever all or part of the left colon is preserved. Thus, if a sigmoid colostomy is established on the perineum and encircled by anal sphincters which

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From the Department of Surgery, Boston University School of Medicine, and the Surgical Service of the Framingham Union Hospital.

1. McVay, J. R.: Ann. Surg. **76**: 755-767, 1922.
2. Gilchrist, R. K., and David, V. C.: Ann. Surg. **108**: 621-642, 1938; **126**: 421-438, 1947.
3. Glover, R. P., and Waugh, J. M.: Surg., Gynec. & Obst. **82**: 434-448, 1946.
4. Wood, W. Q., and Wilkie, D. P. D.: Edinburgh M. J. **40**: 321-343, 1933. Gabriel, W. B.; Dukes, C., and Bussey, H. J. R.: Brit. J. Surg. **23**: 395-413, 1935. Coller, F. A.; Kay, E. B., and MacIntyre, R. S.: Surgery **8**: 294-311, 1940. Grinnell, R. S.: Ann. Surg. **116**: 200-216, 1942.

are entirely functionless, reservoir continence can be developed by the same measures used in abdominal colostomy and the resulting continence mistakenly attributed to the retained sphincters. There is reason to believe that, in a number of reported series in which the functional value of retained sphincters has been evaluated, exactly this mistake has been made.

Sphincteric Continence.—The term sphincteric continence refers to the active contraction of the striated muscle of the external anal sphincter, which thereby resists the propulsive force of colonic peristalsis. Denny-Brown and Robertson[5] have shown that there is no damping, or inhibitory, effect on colonic peristalsis when the sphincter is voluntarily contracted. The sphincter therefore acts by mechanically blocking the progress of the fecal mass, and the force of sphincteric contraction must exceed the propulsive force of colonic peristalsis to be effective.

It is worthy of emphasis that normal persons have both reservoir continence and sphincteric continence; that is, a smooth muscle reservoir lies above normally functioning sphincters. This is an important consideration when the ileum, which normally is not a reservoir organ, is brought down to the anal sphincters after total colectomy for such diseases as ulcerative colitis and multiple polyposis.

THE ANAL SPHINCTERS

Textbooks of anatomy commonly describe two anal sphincters: the internal and the external. The internal sphincter consists of a condensation of the circular smooth muscle fibers of the rectum. Like smooth muscle elsewhere in the body, it is under the control of the autonomic nervous system and, as will be demonstrated, takes part merely in the peristaltic activity of the smooth muscle of the rest of the rectum and has nothing to do with sphincteric continence. Thus, the statement, repeatedly noted in surgical literature, that division of the internal sphincter causes incontinence is misleading. Surgical division of the internal sphincter is necessarily accompanied by complete division of the external sphincter, and it is this latter maneuver which results in loss of sphincteric continence.

The external anal sphincter consists of striated muscle, is innervated by somatic nerves, and, therefore, is under the control of the voluntary nervous system. It is commonly assumed that this sphincter functions as a simple purse string. That such is not the case has been demonstrated by experimental studies which have been previously reported.[6] These studies point the way to successful methods for the preservation of fecal continence and have been amply confirmed by clinical observation.

SUMMARY OF EXPERIMENTAL STUDIES

Like striated muscle in other parts of the body, the external anal sphincter fatigues quickly. This fact can be readily confirmed by introspection and has been demonstrated experimentally by placing a balloon, connected for kymographic recording, within the anal canal. After the temporary spasm caused by the introduction of the balloon has subsided and the basic tonus of the sphincter has been noted, the subject is requested to contract the sphincter with all possible force and for as long a time as possible. An analysis of graphs obtained by this method indicates that maximal contraction is sustained for only a few seconds and, even with continued effort, is followed by a steady and progressive fall of sphincter tone until the base line is reached. In a series of normal persons, the average maximal contraction was 44 cm. of water and the average length of time during which any contraction was possible was 53 sec.

The fact that the sphincter fatigues so readily makes it evident that some mechanism is required to correlate the activity of the sphincter with the peristaltic activity of the colon. The fact that such a correlation exists has been demonstrated by filling the colon to the limit of toleration with saline solution by means of an enema. This stimulates peristalsis, and the increases in intrarectal pressure brought on by peristalic waves have been recorded kymographically. Balloon recordings of sphincter tone made simultaneously demonstrate that with each peristaltic wave the increased pressure exerted against the outlet is countered by an appropriate degree of contraction of the anal sphincter. As the peristaltic wave recedes and the pressure against the sphincter falls, relaxation of the sphincter takes place, only sufficient tone being maintained at any given moment to counter effectively the peristaltic thrust. Since peristaltic waves ordinarily last less than one minute and since the peak of each wave lasts only a few seconds, it is evident that maximal contraction of the sphincter is required for only a few seconds at a time and that its endurance is sufficient for the demands ordinarily put upon it.

The following facts were repeatedly and consistently demonstrated in normal adults by the application of a method which made it possible to record simultaneously and independently on a kymograph the tone of each of the two sphincters:

1. Stimulation of the rectum by distending a balloon within its lumen caused a sustained fall of internal sphincter tone. This fall was proportional to the degree of distention of the rectal balloon and was sustained until the balloon was deflated. Thus, the internal sphincter evidently plays no part in sphincteric continence but rather, by its relaxation during rectal stimulation, prepares the way for defecation. This rectal stimulation also caused a sharp rise of external sphincter tone which was of short duration. The greater the stimulus applied to the rectum (i. e., the larger the balloon) the greater was the force of the corresponding contraction, but the duration of the contraction was not increased. Thus, as the intrarectal pressure was increased by enlargement of the balloon, the external sphincter contracted only sufficiently to maintain continence. As soon as the intrarectal pressure was diminished by relaxation of the smooth muscle of the rectum, sphincteric contraction was no longer needed and fell rapidly to its original level.

2. Stimulation of the sigmoid colon by the same method caused no change in the tone of either the internal or the external sphincter.

3. When the balloon was placed high in the rectum, near the rectosigmoid junction, the stimulus resulting from its distension caused the characteristic responses of both the internal and external sphincters; but the responses were feeble. When a similar stimulus was applied to the midrectum, the magnitude of the responses was greater. When the stimulus was applied to the distal portion of the rectum, still greater sphincter responses

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[5] Denny-Brown, D., and Robertson, E. G.: Brain 58: 256-310, 1935.

[6] Gaston, E. A.: Surg., Gynec. & Obst. 87: 280-290 and 669-678, 1948.

were obtained. Thus, the farther distally in the rectum the stimulus was applied, the greater were the sphincter responses.

4. Stimulation of the rectum in a patient with complete transection of the spinal cord produced a normal relaxation response of the internal sphincter but no corresponding contraction response of the external sphincter.

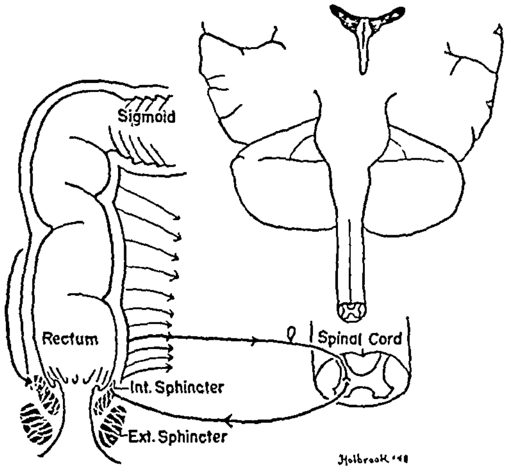

Fig. 1.—The reflex connections between the rectum and the internal sphincter.

COMMENT

The experimental findings indicate that nervous reflexes exist between the rectum and the internal sphincter and between the rectum and the external sphincter and that there is no such reflex connection between the sigmoid colon and the sphincters. The receptor units which initiate these reflexes are sparse per unit area in the upper rectum and become progressively more numerous per unit area in the lower rectum. Because the internal sphincter reflex is retained in complete transection of the spinal cord, it is evident that higher cerebral centers are not necessary to its characteristic relaxation response (fig. 1). This point is of only academic interest since, as has been shown, the internal sphincter plays no part in sphincteric continence. However, the external sphincter reflex is destroyed when the spinal cord has been transected; and cerebral connections must, therefore, be required for its completion (fig. 2). The reflex arc of the external sphincter may also be broken by division of the peripheral motor nerves which supply the external sphincter. It is conceivable that such an accident could occur during resections of the rectum since the inferior hemorrhoidal nerves to the external sphincter are closely applied to the inferior surfaces of the levator ani muscles, which must be divided when the lower part of the rectum is freed.

Most pertinent to this discussion, however, is the fact that the reflex arc can be broken by removal of the afferent nerves which originate only in the rectum. When all of the rectum is removed, the receptor units of the rectosphincteric reflexes are also removed, and the mechanism by which the external sphincter is warned as to when and to what extent its services are required is destroyed. It is therefore evident that the rectum is as essential to sphincteric continence as is the sphincter itself.

It has been possible to confirm the importance of the afferent portion of the reflex arc by investigation of a woman patient who had the entire rectum removed and the sigmoid colon pulled down to take its place. The external sphincter and its motor nerve supply were preserved intact, for it can be voluntarily contracted and has normal strength and a normal fatigue curve. Sphincteric continence does not exist, however, because bowel content escapes before there is any warning that its escape is imminent, and balloon studies show no reflex response of the sphincter when the "new rectum" is stimulated. It has been necessary to place this patient on a colostomy regimen consisting of attention to diet and colonic irrigations every second day. On this regimen reservoir continence, exactly as in a patient with abdominal colostomy, has been developed to the point where she is able to carry on her usual activities. From the standpoint of fecal continence, the retained sphincter is of no functional value.

Since resection of all of the rectum leads to loss of sphincteric continence, the question arises as to how much rectum must be retained in order to preserve satisfactory sphincteric function. From the study of a number of patients in whom varying amounts of rectum have been preserved it would appear that approximately the distal fourth of the rectum is required for this purpose. In this respect it should be emphasized that the rectum varies in length in different persons. It is longer in women than in men and longer in tall people than in short people. For this reason it is probably best to express the amount of rectum that is required for the preservation of sphincteric continence in terms of the initial length of the rectum, as measured with the sigmoidoscope

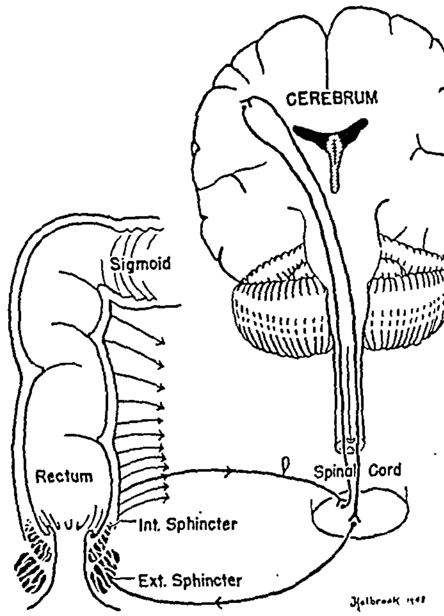

Fig. 2.—The reflex connections between the rectum and the external sphincter. Cerebral connections are required for the completion of this reflex.

Because the sensory nerve supply of the distal colon and rectum parallels that already described for the afferent portion of the rectosphincteric reflex arc, it is possible to determine clinically when the reflex is intact. If a balloon is distended in the sigmoid colon, sensation is produced in the lower abdomen, usually in the midline but often in the left lower quadrant, which is interpreted as a cramp and not as a desire to defecate. When the balloon is pulled down to a level just below the rectosigmoid junction, a similar degree of distension causes in the sacral or perineal region a sensation which is interpreted as a mild desire to defecate. The lower in the rectum the balloon is placed, the greater is the sacral or perineal sensation resulting from an equal degree of distension. Therefore, if the patient who has had a portion of the rectum removed has a sensation located in or near the perineum which approximates that to which he is normally accustomed when a bowel movement is imminent, and if he is able to contract voluntarily the external sphincter in a normal fashion, both the afferent and efferent portions of the reflex are intact, and true sphincteric continence exists.

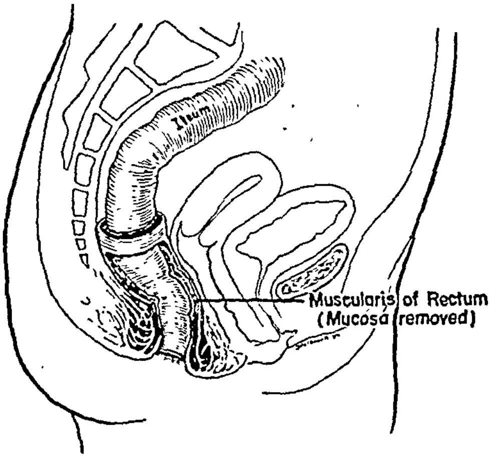

Fig. 3.—Diagram of Ravitch operation. Since the muscular wall of the rectum is retained, the afferent portion of the rectosphincteric reflex is preserved.

Since reservoir continence alone can be developed to such an extent that an individual is able to resume his social obligations without embarrassment, it has been of some interest to observe a patient who has only sphincteric continence. This concerns a woman, aged 43, who suffered recurrent bouts of ulcerative colitis for a period of 11 years. A terminal ileostomy was done in June, 1947, because of a severe exacerbation of the disease, and was followed by dramatic improvement in her general condition. On March 4, 1949, approximately two years later, a total colectomy and anal ileostomy were performed using the technique described by Ravitch.[7] The entire colon and all but the distal 7 cm. of the rectum were removed. The mucosa was removed from the retained distal segment of rectum and the terminal ileum brought through this muscular cuff and sutured in place (fig. 3). Thus, the sphincter and its motor nerve supply were not disturbed and the afferent portion of the rectosphincteric reflex arc was preserved in the retained muscularis of the rectum. The postoperative convalescence was complicated by pelvic sepsis, which required the reestablishment of an abdominal ileostomy and local drainage. Eventually the sepsis cleared and healing was complete. The abdominal ileostomy was closed in November, 1949. Approximately five months later the patient had a perfectly normal anal sphincter and sufficient rectal muscularis with its afferent nerve supply so that a normal rectosphincteric reflex remained. The desire to defecate was manifested by a normal sensation located in the perineum. While she was able to retain the contents of the ileum by sphincteric contraction in a normal fashion, she was able to do so for only short periods of time and went to stool at least once an hour throughout the day and night. It seems evident that the poor result in this case is due to the fact the terminal ileum is not normally a reservoir organ and, until that time, had failed to take over the function of a reservoir. Thus, sphincteric continence exists without associated reservoir continence and the functional result is much less satisfactory than when the reverse is true.[8]

SUMMARY AND CONCLUSIONS

Fecal continence can be subdivided into reservoir continence and sphincteric continence. Both reservoir continence and sphincteric continence must be retained if normal fecal control is to be preserved. Reservoir continence alone is of greater practical value than sphincteric continence alone.

The preservation of reservoir continence requires the retention of some portion of the left colon to act as a reservoir organ. The ileum is often unsatisfactory for this purpose.

Sphincteric continence depends upon a nervous reflex, the afferent fibers of which arise in the rectum, the efferent fibers terminating in the external anal sphincter. The rectum is therefore as much a part of the sphincter mechanism as is the sphincter itself. If all of the rectum is removed, sphincteric continence is lost because this reflex arc is broken by removal of the afferent nerves.

If sphincteric continence is to be preserved in rectal resections, it is necessary to retain not only the external anal sphincter but also some portion of the immediately superjacent rectum. Probably the distal fourth of the rectum is sufficient for this purpose.

190 Concord St.

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[7] Ravitch, M. M.: Surgery 24: 170-179, 1948.

[8] Apparently the ileum is sometimes able to take over the function of a reservoir, for Ravitch has reported good functional results in several of his cases. However, a number of other surgeons have found the operation unsatisfactory because of the intolerable frequency of stools.

The Cortical Steroids.—The measurement of 17-ketosteroids in the urine is of no value in assessing the rate of secretion of cortical hormone in man. Considerable confusion has arisen in the clinical literature due to misinterpretation of the significance of urinary 17-ketosteroids. There is a distinct difference between the pattern of urinary steroids in hypercorticism induced by ACTH administration and in adrenal hyperactivity induced by stress. In hypercorticism both corticoids and 17-ketosteroids are excreted at a rate greater than normal; in adrenal hyperactivity associated with stress the corticoids are increased but the 17-ketosteroids are usually decreased. The evidence indicates that the metabolic pathways concerned with the "utilization" and/or degradation of the cortical steroids undergo qualitative and possibly quantitative changes under the influence of stress.—George Sayers, Regulation of the Secretory Activity of the Adrenal Cortex, *The American Journal of Medicine*, May, 1951.

NONSPECIFIC ULCER OF THE SMALL INTESTINE

REPORT OF FIVE CASES

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Nonspecific ulcer of the small intestine is one of the rare and particularly enigmatic diseases of the abdomen. Little is known of this intestinal lesion. The clinical picture is vague and confusing, making preoperative diagnosis almost an impossibility. The etiology is unknown. The histologic characteristics are a matter of record, but they give little indication of the pathogenesis of the lesion.

Excellent papers have appeared in the literature tabulating the cases which have been reported and summarizing what is known of the disease.[1] This type of ulcer was first described in 1805 by Matthew Baillie; yet in 1947, when Evert, Black, and Dockerty [1a] at the Mayo Clinic made a study of the literature, they found a total of only 130 cases, including 14 from their own clinic. The purpose of this paper is to report five cases which were seen in the past three years in a city hospital which admits a yearly average of 22,000 patients.

REPORT OF CASES

Case 1.—W. D., a Negro man aged 39, had had persistent abdominal distention for 12 days, accompanied with intermittent colicky abdominal pain, nausea, and vomiting. The patient was acutely ill and had a temperature of 100.2 F. on admission. The abdomen was protuberant and hyperresonant to percussion. There was generalized tenderness referred to the right lower quadrant. Peristalsis was present but hypoactive. Examination of the rectum revealed moderate tenderness high on the right. Roentgenographic examination of the abdomen revealed severe distention of the entire small intestine.

Laparotomy was performed, and about 500 cc. of pinkish-tan peritoneal fluid was encountered. The distal ileum and the cecum were collapsed. The proximal small intestine was distended with fluid. In the midileum an area approximately 30 cm. in length was violaceous in color; multiple perforations were present and were loosely sealed with overlapped segments of dilated intestine. The intestine was emptied of its contents by aspiration through one of the perforations. The diseased segment was resected and an end-to-end anastomosis was established.

Postoperative examination of the small intestine by contrast roentgenogram, typhoid and brucellosis agglutination tests, and cultures of the urine and stool for typhoid bacilli were all negative. The patient was seen three months later and was found to be asymptomatic.

Histologic Examination.—Near one end of the segment of ileum, there was a rent about 5 cm. in length that extended completely through the intestinal wall and had rather smooth edges. The serosal surface was shiny and mottled deep purplish-red. The intestine was edematous as was the mesentery attached to it. All layers of the intestinal wall were involved in a chronic inflammatory reaction. There were multiple areas of dissolution of the mucosa with ulceration, and healed lesions were present. The medium-sized veins and a few arteries in the wall showed segmental destruction of the vessel wall, associated with a developing thrombosis.

Case 2.—G. B., a Negro man aged 48, was admitted to the hospital for regulation of mild cardiac decompensation. There were no abdominal complaints, and the history concerning gastrointestinal disease was insignificant. On the fourth day mild pain developed in the left lower quadrant, accompanied with nausea. The pain persisted during the ensuing 24 hours and became increasingly severe and colicky.

The white blood cell count had risen from 6,700 on admission to 13,600; the nonprotein nitrogen blood level was 61 mg. per 100 cc. Blood pressure was 190 systolic and 140 diastolic; temperature was 101.8 F. The heart was well compensated but fibrillating slowly.

Examination of the abdomen revealed generalized tenderness referred to the left lower quadrant. Peristalsis was present but hypoactive. The liver was enlarged but nontender. Examination of the rectum was noncontributory.

Laparotomy was performed. There was no visible free fluid when the peritoneal cavity was opened. An area of thickened, edematous jejunum was noted approximately 45 cm. from the ligament of Treitz. In the middle of this area there was a patch 2.5 by 1 cm. in which the serosa was yellow and mottled with red. Palpation at that point demonstrated thinning of the intestinal wall. The entire thickened area, including margins of 5 cm. of normal intestine, was resected, and an end-to-end anastomosis was established.

The patient was examined two and one-half months after the operation and was found to be asymptomatic.

Histologic Examination.—The specimen was a segment of jejunum measuring 17 cm. in length. The mucosal surface was interrupted by a 3 by 1.5 cm. yellowish-green area of ulceration. The mucosa surrounding this area was fiery red. An ulcer involved a portion of the muscularis, the submucosa, and the mucosa. An acute inflammatory process extended through the wall of the intestine. The vessels appeared dilated and congested; several contained fibrin thrombi, and some of the vessel walls showed infiltration by polymorphonucelar leukocytes. The serosal surface showed acute inflammation and the presence of fibrin.

Case 3.—C. B., a boy aged 19, had had sudden onset of lower abdominal pain, colicky in nature and accompanied with one episode of vomiting, about six hours previous to admission. Several months previously an appendectomy had been performed for a ruptured appendix, later followed by division of adhesions to relieve intestinal obstruction. There had been no other complaints.

The patient's temperature was 100.2 F. on admission. There was moderate rigidity of the abdomen with extreme rebound tenderness over the umbilicus and in both lower quadrants. Peristalsis was absent. Examination of the rectum revealed tenderness high on the right and in the midline. Roentgenographic examination of the abdomen disclosed nothing of significance.

Laparotomy was performed by Dr. Lewis Sharman. There was a small amount of cloudy peritoneal fluid. Two perforations were noted approximately 25 cm. proximal to the ileocecal valve: One was approximately 1 cm. in diameter; the other, 3 mm. In the area of the perforations, the intestine was edematous and thickened; distally, the lumen was narrowed but not occluded. There was no evidence of mechanical obstruction. The involved area of the ileum was resected, and an end-to-end anastomosis established.

Contrast roentgenographic examination of the abdomen one month after the operation revealed a normal ileum. The patient was seen at intervals for three years; the only complaint he had was occasional cramping abdominal pain. Results of roentgenographic examination of the gastrointestinal tract and physical examination at his last visit were normal.

Histologic Examination.—The specimen was 5.5 cm. of ileum, measuring in circumference 7.5 cm. at one end, 3 cm. in the middle, and 4.5 cm. at the distal end. Just proximal to the constricted area was a perforation 1.5 cm. in diameter with ragged edges. The surrounding serosal surface was granular and cov-

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From the Whitehead Department of Surgery, Emory University, and the Grady Memorial Hospital.

[1] (*a*) *Evert, J. A.; Black, B. M., and Dockerty, M.:* Primary Nonspecific Ulcers of the Small Intestine, Surgery **23:** 185, 1948. (*b*) Morrin, F. J.: Spontaneous Perforation of Primary Jejunal Ulcers, Irish J. M. Sc. (sér. 6) 198, 1931. (*c*) Ebeling, W. W.: Primary Jejunal Ulcer, Ann. Surg. **97:** 857, 1933.

ered by an exudate composed of fibrin and neutrophils. The mucosal surface showed regenerating epithelium with hyperplasia, but there was no evidence of malignancy. The muscular layer terminated a short distance from the perforation by gradually thinning. The appearance of the muscular coat suggested that the perforation occurred at the site of a diverticulum.

Case 4.—M. D., a man aged 80, had a history of indigestion for five days prior to admission. He denied previous intestinal disorders. A local physician reported that two days before admission, examination had revealed a hernia which was easily reducible; the abdomen had been soft and nontender, and peristalsis had been active.

Examination on admission revealed an acutely ill patient with a temperature of 102 F. The odor of his breath was slightly uremic. Rales were present in both lung bases. The abdomen was slightly distended and exquisitely tender, with rebound tenderness in the entire lower abdomen. Peristalsis was absent. There was a cystic, nontender mass in the left inguinal region. Examination of the rectum revealed nothing significant. A roentgenogram of the abdomen disclosed no abnormality and a chest film revealed no evidence of pulmonary disease. The white blood cell count was 13,500; the nonprotein nitrogen level was 50 mg. per 100 cc.

Herniotomy was performed, but no incarcerated intestine was found. Therefore, an exploratory laparotomy was performed by Dr. Wilbur Scott. In the proximal 30 cm. of the jejunum there were matted and adherent intestinal loops bound one to another with fine fibrinous and fibrous adhesions; in the midportion of this area was a hemorrhagic, friable segment of intestine 15 cm. in length, in the center of which a perforated ulcer was present. Biopsy was performed, and layer transverse closure of the intestine was used.

Summary of Five Cases of Nonspecific Ulcer of the Small Intestine

Case	Age, Yr.	Sex	Race	Preoperative Diagnosis	Duration of Symptoms	Location of Ulcer	Complications	Operative Treatment	Result
1	39	M	Negro	Ruptured appendix with intestinal obstruction	12 days	Ileum	Perforation	Resection, end-to-end anastomosis	Recovery
2	48	M	Negro	Mesenteric thrombosis or diverticulitis of sigmoid	1 day	Jejunum	....	Resection, end-to-end anastomosis	Recovery
3	19	M	White	Inflammation appendiceal stump or intestinal obstruction	6 hr.	Ileum	Perforation	Resection, end-to-end anastomosis	Recovery
4	80	M	White	Strangulated hernia	5 days	Jejunum	Perforation	Transverse closure	Died after 5 days
5	34	F	Negro	Jejunitis with ulcer (X-ray) or intestinal obstruction	8 yr.	Jejunum	....	Resection, jejunoduodenostomy	Recovery

Postoperatively the patient was moderately disoriented for 48 hours and then gradually improved. On the fifth day his temperature suddenly rose to 106 F.; he died the following day. Death appeared to result from massive pulmonary embolism. Permission for necropsy was not granted.

Histologic Examination.—Biopsy of the jejunum showed the mucosa to be absent in some sections with blood clot protruding through the space. The clot contained acute inflammatory cells out of proportion to the red cells. The inflammation extended throughout the submucosa at the border. There was early degeneration of the muscle and connective tissue fiber.

Case 5.—L. O., a Negro woman aged 34, had been observed in 1941, at which time she had a history of hematemesis and melena. An ulcer niche in the pyloric region was seen on roentgenographic examination. There was no history of ulcer symptoms. She was readmitted in 1944 with a history of persistent nausea and vomiting and a weight loss of 30 lbs. (13.6 Kg.). Contrast roentgenographic examination of the gastrointestinal tract showed no abnormalities. In 1945, a moderate dilatation of the duodenal bulb and the proximal half of the duodenum was observed by roentgenogram. At that time there was a recurrence of postprandial nausea and vomiting, but the patient refused surgery.

In 1948, the patient returned complaining of a recurrence of melena, accompanied with cramping, gnawing epigastric pain, and persistent postprandial nausea and vomiting. Physical examination was noncontributory. Roentgenographic examination of the gastrointestinal tract revealed a constriction of the proximal jejunum; there was some dilatation proximal to the constricted area indicating a partial occlusion of the lumen of the intestine. A diagnosis of jejunitis with ulcer or high intestinal obstruction was made. The patient again deferred surgery.

The symptoms of upper intestinal obstruction persisted, and in 1949 laparotomy was performed by Dr. John Durden. The distal duodenum and proximal jejunum were markedly dilated, and the wall of these areas was slightly thickened. Immediately distal to the dilated area was a narrowed area 2.5 cm. in diameter, and at this point an ulcer was found. Distal to the narrowed area the jejunum was normal. The upper jejunum was resected and an end-to-end jejunoduodenostomy established.

The patient's postoperative period was uncomplicated. At the end of six months she was asymptomatic and had gained weight.

Histologic Examination.—The specimen was a segment of the distal duodenum and proximal jejunum measuring 24.5 cm. in length. The proximal end measured 7.5 cm. in diameter and had a slightly thickened wall. The dilated portion ended abruptly 3.5 cm. from the proximal end of the specimen, at which point there was a puckered stricture with the diameter narrowed to 2.5 cm. The wall here was slightly thickened and indurated. There was a shallow ulceration with a pinkish-tan granular base and sloping edges. In the adjacent mesenteric fat 16 lymph nodes varying from 2 to 15 mm. in diameter were identified. There was evidence of minimal regenerative activity of the mucosa at the edge of the ulcer, as evidenced by a single layer of flattened epithelial cells extending over the granulation tissue for a short distance from the edge of the mucosa.

COMMENT

The diagnosis of nonspecific ulcer of the small intestine is very difficult. A case reported by Ebeling[1c] in 1933 was the first in which diagnosis was made preoperatively. In the chronic type the lesions form slowly, and months or years of vague and bizarre, but definite, abdominal discomfort, and occasionally even hemorrhage into the intestinal tract, may be suffered by the patient. On the other hand, perforation of the intestine may actually occur without previous indication of pathologic change, the first symptoms being those of perforation of a hollow viscus into the peritoneal cavity. These symptoms may simulate various acute abdominal conditions, such as ruptured peptic or duodenal ulcer or acute appendicitis.

In four of the five cases presented here the condition was acute, with perforation in three. The duration of symptoms ranged from 12 days to six hours. The chief symptoms were nausea, vomiting, and nonlocalized, persistent abdominal pain which had started suddenly and was occasionally colicky. Neither melena nor hematemesis was present. The patients had fever on admission, usually leukocytosis, abdominal distention with tenderness, rebound tenderness, and rectal tenderness. Roentgenographic studies of the abdomen were without diagnostic significance.

In the chronic case there was a history of melena and considerable weight loss. The patient was observed over a period of approximately nine years. In the eighth year the roentgenographic studies of the gastrointestinal tract indicated a contracted area of jejunum with dilatation behind that area. A tentative diagnosis of jejunal ulcer was made. This was the only instance in the five cases reported here in which the correct diagnosis was made preoperatively. It is obvious that the symptoms in the acute cases were of little value for a specific diagnosis. Even those in the chronic case made diagnosis problematic.

As reported by others, the majority of these cases occurred in adult males.

The mortality rate from this lesion is high. Morrin[1b] reported a collection of 85 cases with 56 fatalities, or a mortality rate of 66 per cent. In the 45 cases collected by Evert and his associates[1a] following Morrin's report, there were 21 deaths, a mortality rate of 47 per cent.

Surgery is the only means by which this lesion has been successfully treated, but there is no single procedure used for its successful removal. Although the reports in the literature indicate that simple closure may reduce the risk of operation, it was the general opinion that resection would be the better procedure.

Free perforation was present in 26 of the 45 cases collected by Evert and associates. Simple closure was used in nine, with one fatality; excision of the ulcer and transverse closure in three, with one fatality; and resection and anastomosis in five, with three fatalities. In Morrin's collection there were 38 cases with perforation in which some type of operative procedure was used: suture alone in 23, with 10 fatalities; and resection in six, with two fatalities. Robinson and Wise,[2] reviewing 39 cases in 1940, found that 18 were treated by resection and anastomosis, with four fatalities, and 15 were treated by simple transverse closure, with six fatalities.

Resection and establishment of an end-to-end anastomosis was carried out in four of the five cases reported here; in two of these, perforation had occurred. There was perforation in one (case 4) in which transverse closure was used. This was the only case which terminated in death, although death appeared to result from pulmonary embolism. These five cases do not warrant definite conclusions, but the impression from them is that resection would be the procedure of choice even in patients who were poor risks for any surgery.

The patients whose cases are discussed here were prepared for operation by the routine used in this hospital for intestinal surgery, whether emergency or elective. Levin intubation with Wangensteen suction was performed, and blood and fluids were administered intravenously as indicated, depending upon the state of dehydration. The preferred anesthesia was spinal with thiopental analgesia, but gas-oxygen-ether closed inhalation was used if spinal anesthesia was contraindicated.

The patient usually is in no condition to withstand an extensive or prolonged search at laparotomy for the pathologic area, yet it is essential that the small intestine be carefully examined for these lesions when no other pathology which would account for the symptoms is found. If the possible presence of this lesion is kept in mind, the search for the affected part may be more successful.

SUMMARY

Five cases of nonspecific ulcer of the small intestine are presented. Four of the cases were acute and diagnosis was not made until laparotomy was performed. One of the cases was chronic, and diagnosis by roentgenography was made preoperatively. Resection and establishment of an end-to-end anastomosis was carried out in four cases, in all of which the patients survived. One case, in which transverse closure was performed, terminated in death.

478 Peachtree St., N.E. (3).

[2] Robinson, D. R., and Wise, W. D.: Simple Nonspecific Ulcer of the Jejuno-Ileum, Surg., Gynec. & Obst. 70: 1097, 1940.

IMMUNITY IN TUBERCULOSIS

J. Arthur Myers, M.D., Minneapolis

Dependable immunity is established against smallpox by vaccination—why not against tuberculosis? This is the question Koch asked in 1882, and it is still being asked in 1950. Literally scores of physicians and scientists have diligently sought the answer. No pathogenic micro-organism has deceived the medical profession with respect to immunity as often, as continuously or as completely as the tubercle bacillus.

HISTORICAL AND EXPERIMENTAL BACKGROUND

In 1920 and 1921 I was assigned to projects that offered unlimited opportunities to study tuberculosis in all of its stages of development. One of them was concerned with aiding in the organization and direction of a tuberculosis control program among students of the University of Minnesota; the other, with a tuberculosis control program for all school children of Minneapolis. I also participated in other projects that included persons beyond university age and even through the period of senility.

The literature revealed numerous attempts to immunize artificially against this disease. So-called immunizing agents had been produced from bacilli killed by various methods such as heat, light rays and lipid solvents. Some workers reported apparent success, but ultimately all failed.

The attempt to vaccinate with living virulent and attenuated tubercle bacilli was begun by Cavagnis in 1886. Before the nineteenth century closed, several others were active in this field. In 1902 von Behring administered intravenously to calves living human type tubercle bacilli with greatly reduced virulence for guinea pigs. Inoculation with this bovovaccine appeared to re-

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sult in definite resistance to virulent tubercle bacilli. It was recommended for and used in large numbers of cattle in several nations, and its use was made obligatory in some European provinces. Von Behring's claims were so convincing that the German government constructed a large institute where he made the vaccine for worldwide distribution. The passage of time proved that the apparent resistance produced by this vaccine was of short duration and not sufficiently effective to be of practical value. Numerous investigators entered the field, including Koch, Neufeld, Miessner, Heymans, Klimmer, Arloing and Theobald Smith, seeking to modify von Behring's method so as to make it effective.

Calmette and Guérin, working with virulent bovine bacilli which Nocard had isolated from the udder of a tuberculous cow (1902), observed that the bacilli grew perfectly on a special medium. Moreover, their virulence diminished progressively until large doses did not seem to harm calves for at least 18 months. These calves also manifested apparent resistance to virulent tubercle bacilli. In 1921 Calmette named this organism BCG (bacillus Calmette-Guérin) and in 1924 declared it a *virus fixé*.

When our work began, in 1920, all the previous experiments aimed at production of dependable artificial immunity had failed. Although sweeping claims were being made for the widely discussed efficaciousness of BCG, its use was still limited to animals. We decided to support a fundamental program in which tuberculosis is treated as a contagious disease and by which tubercle bacilli are prevented from invading living human and animal tissues. Our predecessors and colleagues had completed a sanatorium building program in 1918, but there were still many persons with contagious tuberculosis unaccommodated in sanatoriums. Veterinarians were attacking the bovine type of tubercle bacillus, but there was still much contagious tuberculosis among cattle. Sanatorium staffs, public health workers, physicians in practice, nurses, social workers, veterinarians and a large segment of the citizenry of the state engaged in this fundamental tuberculosis control program.

EARLY CLINICAL TRIALS

By 1922 Weill-Halle of France was administering BCG to infants. Over the next few years the claims of Calmette and his disciples were so sweeping that we were faced with heavy pressure to infect those for whom we were responsible with this living tubercle bacillus in the hope of immunizing them. The opportunity to confer personally with Calmette as well as to hear him read a manuscript on vaccination of newborn infants came in 1926. He stoutly maintained that vaccination with BCG was harmless, that the virulence of the organisms was absolutely and permanently fixed and that efficaciousness in safeguarding infants from immediate environmental contagion had been "demonstrated beyond doubt." In our opinion Calmette had added nothing new, and his claims with reference to harmlessness and efficaciousness were not unlike those of many others who had preceded him but were later proved to be wrong.

As our tuberculosis control projects by fundamental methods progressed, we kept in close touch with reports of those attempting to immunize with BCG and later with vole tubercle bacillus. Calmette believed his vaccine to be so efficacious that when leading clinicians of France urged a carefully controlled study he refused them and encouraged mass vaccination without the benefit of scientific proof. Thus, scientists and outstanding physicians lost confidence in him. His reports of 1927 and 1928 were severely criticized by statisticians such as Greenwood and others, including the editor of the *British Medical Journal*. About the same time, Petroff stated that BCG had regained virulence in his laboratory. Then came the Lübeck disaster, in which 77 of 250 vaccinated infants died of tuberculosis (presumably from contamination of the vaccine).

Calmette's original work was on animals, particularly cattle (1908 to 1922), and he reported such good results that enthusiasm ran high. In the United States, veterinarians and others put BCG to the most rigid and carefully controlled tests, but they found it of no practical value. In fact, when subjected to the same exposure, cattle that had received BCG contracted as much destructive tuberculosis as the controls. The veterinarians of North America then proceeded with their long since established fundamental tuberculosis control measures. By such means they accomplished results that have never been attained anywhere in the world through the use of BCG.

After these catastrophes and other setbacks, enthusiasm for BCG reached a low ebb throughout the world except in Scandinavia, where Heimbeck (1927) and, later, others, including Holm and Wallgren, maintained interest. In the United States, Park and associates, of the New York City Department of Health, instituted a study on BCG among children in 1926. Rosenthal of Chicago brought BCG from France in 1934 and is now its most enthusiastic proponent in this country.

ACCUMULATION OF CLINICAL DATA

Soon after 1920 we observed that when children first became reactors to tuberculin a small percentage of them had fever, erythema nodosum, pleurisy, enlargement of hilar structures and small infiltrates in the lungs. When these manifestations subsided, the children appeared well. An occasional child had fatal pneumonia, meningitis or miliary disease. As the years passed, we observed many persons, particularly students of nursing and medicine, who first became infected with tubercle bacilli in adulthood. These adults responded exactly as children do when first infected, and the manifestations, such as erythema nodosum, pleurisy, enlarged hilar structures and the like, were essentially the same as those observed among children.

It is around these "allergic manifestations" that occur about the time hypersensitivity is first in evidence and for a short time thereafter that the BCG program has been developed for which so much enthusiasm has been manifested. A sizable number of workers have reported definitely less erythema nodosum, enlarged hilar shadows and other symptoms among children and young adults who have received BCG than among controls. Probably one reason for this observation is that after primary lesions were produced in the skin and regional lymph nodes with BCG, one would not expect as much evidence of such lesions in the lungs with markedly enlarged hilar lymph nodes. It would also seem likely that the allergy produced by an organism of low virulence like BCG would be of less degree than that from virulent tubercle bacilli; hence, less erythema nodosum.

Another reason is the comparison of unlike conditions. It has been contended that far more tuberculosis develops among students of nursing and medicine who become infected while in school than among those who enter with infections established. The fact is overlooked that those who enter as tuberculin reactors already have tuberculous lesions containing tubercle bacilli. When they became infected earlier in life, some of them, and others in the group from which they were drawn, had such manifestations as erythema nodosum, pleurisy, enlargement of hilar shadows and primary infiltrates. An occasional one had acute fatal tuberculosis and therefore was eliminated from the group. On entrance to professional schools, a few had evidence of calcific deposits or diaphragmatic changes. The majority had no abnormal x-ray findings, but the tuberculin reaction attested the presence of lesions. The above allergic manifestations developed in those who first became infected in school, but after these manifestations subsided their tuberculosis status was the same as that of their tuberculin reactor classmates on admission—that is, both groups then had primary tuberculous lesions containing living tubercle bacilli.

Among the subjects of some of our earlier observations were 160 medical students who entered as tuberculin reactors, and in 3.1 per cent of whom reinfection type of lesions developed while they were in school or soon after graduation; whereas, among 145 who became reactors while in school, demonstrable lesions developed in 9.6 per cent. This might be interpreted to mean that more than three times as many students who became reactors while in school acquired clinical tuberculosis than did those who entered as reactors. Actually this is not true. In fact, of the 9.6 per cent in whom demonstrable lesions were seen, primary complexes and pleurisy accounted for 6.2 per cent, whereas only 3.4 per cent acquired chronic reinfection type of tuberculosis. Thus, only the 3.4 per cent is comparable with the 3.1 per cent of clinical lesions among the students who entered as reactors. Observations on students of nursing revealed almost identical findings. Reviewing the observations on our entire group of students of nursing and medicine, we have been unable to find any significant difference in the development of the chronic reinfection type of tuberculosis between those who entered as reactors and those who became reactors while in school.

A third reason could be a difference in the disease itself. No doubt erythema nodosum occurs more frequently in Scandinavia among persons who recently became allergic than happens in our area. Moreover, we have rarely seen the adult just infected in whom progressive pulmonary tuberculosis immediately developed, as is reported to occur often in Scandinavia.

Demonstrable lesions and conditions that are in evidence about the time allergy can be elicited and those that appear in the next year or so have constituted an extremely small part (not more than 3 per cent) of the lesions which develop in this vicinity (chart 1). This is the only group of lesions for which significant claims have been made for BCG.

UNDUE RELIANCE ON X-RAY FINDINGS

Unfortunately, in nearly all of the reports made to date on morbidity among both vaccinated and controls, the diagnoses of chest conditions have been made largely from x-ray shadows alone. Inasmuch as x-ray shadows are never pathognomonic, all diagnoses are subject to honest questioning unless the presence of tubercle bacilli has been demonstrated by culture or animal inoculation. Deaths reported by various authors as due to tuberculosis in both the vaccinated and the controls constitute a relatively small total number. Usually no statement has been made as to whether diagnoses were confirmed by necropsy and, if so, whether bacteriological evidence was required. Without the above confirmation, errors in diagnosis may have been frequent.

There is no evidence that BCG has any influence on the occurrence of lesions that often develop two or more years after the initial invasion with tubercle bacilli. So far, only Heimbeck has reported on such observations (1947 and 1948). He traced the nurses who had graduated from the Uleval Hospital, Oslo, Norway, since his studies began. This included those who had entered the school of nursing as reactors to tuberculin, those who entered as nonreactors and accepted BCG and those who refused it. He found no important difference among the three groups.

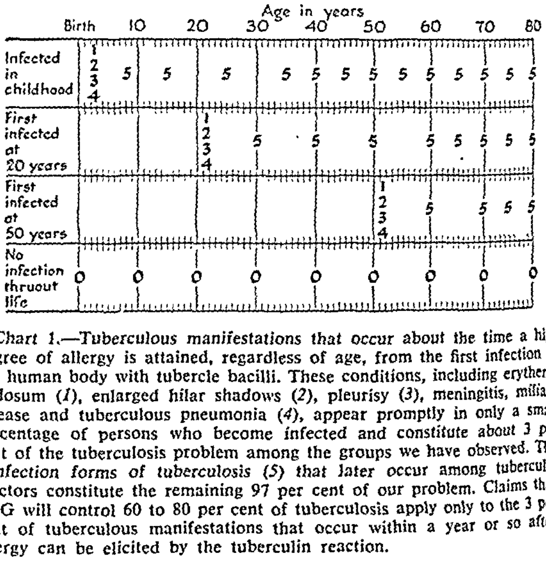
Age in years
Birth
10
20
30
40
50
60
70
80
Infected in childhood
First infected at 20 years
First infected at 50 years
No infection thruout life
1
2
3
4
5
0

Chart 1.—*Tuberculous manifestations that occur* about the time a high degree of allergy is attained, regardless of age, from the first infection of the human body with tubercle bacilli. These conditions, including erythema nodosum (*1*), enlarged hilar shadows (*2*), pleurisy (*3*), meningitis, miliary disease and tuberculous pneumonia (*4*), appear promptly in only a small percentage of persons who become infected and constitute about 3 per cent of the tuberculosis problem among the groups we have observed. The *reinfection forms of tuberculosis* (*5*) *that* later occur among tuberculin reactors constitute the remaining 97 per cent of our problem. Claims that BCG will control 60 to 80 per cent of tuberculosis apply only to the 3 per cent of tuberculous manifestations that occur within a year or so after allergy can be elicited by the tuberculin reaction.

Thus, claims for the efficaciousness of BCG would apply to only about 3 per cent of illness and death from tuberculosis in our area. The remaining 97 per cent have not been investigated, and evidence is lacking that this form of vaccination will be helpful in them.

NO DEPENDABLE IMMUNITY IN TUBERCULOSIS

As our work on fundamental methods of controlling tuberculosis progressed, we were unable to see any premise for attempting to produce artificial immunity because there was no satisfactory evidence that an attack of tuberculosis had ever resulted in dependable immunity. Wherever chronic tuberculosis causes death, in addition to the killing disease found at necropsy, there are always other lesions of long standing. If these lesions result in dependable immunity, why do so many die from tuberculosis? Why is this disease of such antiquity, now the first among all diseases as a cause of incapacity and death among the people of the world as a whole? If everyone had an attack of smallpox prior to the age of 18 years, there would be practically no illness or death from this disease during the remainder of life. Yet, in areas of the world where practically everyone has had an attack of tuberculosis prior to the age of 18 years, clinical tuberculosis exists almost in epidemic form, incapacitating and killing great numbers in the remainder of life's span.

In the early days of our work we accepted the universal teaching that tuberculin reactors were immunized and advised them that they were in no danger of later having clinical tuberculosis. Many of them were apparently healthy children; but, when as young adults a considerable number returned with contagious advanced tuberculosis, we discovered that what we had taught was only theory based on speculation and personal opinions.

Between 1921 and 1941 we had under observation 18,856 children. During the first five years of this period there were 1,033 reactors who were completely examined, of whom 15 already had reinfection type of pulmonary tuberculosis and 39 others acquired it prior to 1941. Eighteen others among the original reactors had on first examination or subsequently acquired extrathoracic reinfection type of tuberculosis.

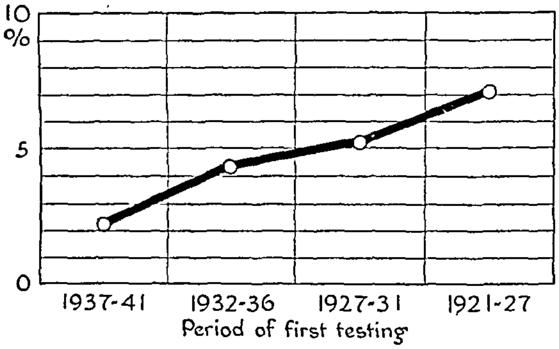

Chart 2.—Incidence of reinfection type of tuberculosis observed among tuberculin reactors. This type of disease increases with the number of years of observation after the infection is first detected.

By 1941 this study revealed that among those who reacted to tuberculin between 1921 and 1926, 7.1 per cent had at the time of the first examination or subsequently acquired the reinfection type of pulmonary or extrathoracic tuberculosis; among children first examined between 1927 and 1931, this percentage was 5.9; among those examined between 1932 and 1936 this percentage was 4.3; among those between 1937 and 1941 this percentage was 2.2. Thus, the longer tuberculin reactors remained under observation, the higher the percentage who developed clinical forms of tuberculosis (chart 2). Similar observations on other groups of people during and since this period convinced us that whatever immunity may develop in tuberculosis is not dependable or predictable.

The human body manifests its best defense against the tubercle bacilli of the first infection. When 1,000 persons (regardless of age) are infected for the first time and the tissues become hypersensitive to tuberculoprotein, a few soon have such symptoms as fever and other allergic manifestations. However, when the same 1,000 persons are reinfected exogenously or endogenously, after the tissues are allergic one may expect both acute and chronic forms of clinical tuberculosis in a considerable number within the next few decades. Acute forms of reinfection type tuberculosis, such as meningitis, miliary disease and pneumonia, may appear soon after allergy is well established. They may also emerge at any subsequent time. As the years pass, the chronic forms of disease loom. Bogen states that clinical tuberculous lesions subsequently develop in about one-half of infected persons, and that more than 10 per cent of these persons ultimately die from tuberculosis. Thus, dependable immunity is not in evidence.

NO CRITERION FOR IMMUNITY AVAILABLE

When our studies began, in 1920, several phenomena were believed to be criteria for immunity. A large amount of fibrous tissue seen on roentgenograms or at necropsy was thought to be a display of immunity. In reality, this is only a response to irritants, some of which cause more fibrosis than do the tubercle bacilli. Silicon dioxide is a good example. Deposition of lime salts was thought to be an excellent indication that immunity or resistance to tubercle bacilli had developed to a high degree. Now we know that this phenomenon is not specific for any disease. It occurs in necrotic tissue or pent-up pus from any cause. In some areas of this country more calcium deposits in the lungs and regional lymph nodes are caused by fungus infections than by tubercle bacilli.

A long interval—from months to decades—occurs between exposures to clinical tuberculosis and the appearance of illness. In many persons illness never develops. These facts were erroneously interpreted as evidence of immunity when, in reality, they indicate only that the defense mechanism has walled off the tubercle bacilli as it would silica particles. However, should the descendants of these bacilli later escape and invade allergic tissues, or should exogenous reinfection occur, there is no dependable immunity to prevent the formation of clinical lesions. For example, children who had been in intimate contact with their tuberculous mother and who appeared well long after her death were thought to have become immune; but observation revealed that during the teen ages, twenties, thirties and even later in life, enough of them fall ill from clinical tuberculosis to give the clinician no confidence in the presence of dependable immunity.

The tuberculin reaction was also regarded as a criterion of immunity. However, our observations revealed that it was only the reactors to tuberculin, children and adults alike, in whom clinical tuberculosis developed. Moreover, nearly every person in other groups of people with proved tuberculosis was allergic to tuberculoprotein. Thus it became obvious that tuberculin reactors at any age are potential patients with clinical tuberculosis. This completely shattered our confidence in the tuberculin reaction as a criterion of immunity.

Rich made an intensive study of this subject and concluded that there is no law of parallelism between hypersensitivity and acquired resistance in tuberculosis. With reference to BCG, Dubos says:

> The development of a positive tuberculin test is universally used as a criterion that the vaccine has "taken" but, unfortunately, as already pointed out, the relation of tuberculin allergy to immunity is one of the most obscure aspects of the pathogenesis of tuberculosis.

He points out that a test devised to measure streptococcal allergy does not measure resistance to streptococcus infection and by analogy the tuberculin test does not necessarily reflect immunity to tuberculosis.

Dubos says:

> . . . it is urgent that techniques be developed for the measurement of true immunity (not tuberculin allergy) in order that the BCG immunization program can be intelligently controlled. Unfortunately we are still in complete ignorance of the immunological mechanisms, humoral or cellular, which bring about immunity to tuberculosis. It is not possible, therefore, to devise any laboratory tests that would control the effectiveness of BCG vaccination.

Inasmuch as no test has been devised, we still do not know how much or how little immunity is acquired by any person. All we know with certainty is that whatever immunity develops is not dependable. Most persons who have reported results of studies on BCG and vole tubercle bacillus have observed that vaccination with these living bacilli is no more efficacious than natural infection with virulent tubercle bacilli. Since natural infection has failed to solve the tuberculosis problem, it does not seem reasonable to believe that it will be resolved by something no better. The reaction to tuberculin is only a test for allergy.

ALLERGY UNDESIRABLE

When it became obvious that allergy is not a criterion of immunity but that it is a prerequisite for the development of destructive forms of tuberculosis, we looked upon the tuberculin reaction as undesirable and therefore to be avoided if success in tuberculosis control was to be achieved. We could see no reason for deliberately producing tuberculosis with its accompanying hypersensitivity to tuberculoprotein by administering living tubercle bacilli of reduced virulence. To us this meant establishing the prerequisite for reinfection type of tuberculosis should infection with virulent tubercle bacilli occur. It was our contention that by adequate fundamental control methods we could gradually but surely prevent allergy by protecting against infection with tubercle bacilli, thus leading to the eradication of tuberculosis.

In 1925, Krause said:

> Accordingly the allergic reaction is seen to be responsible for all of the acute manifestations of tuberculosis and when so considered, it must be viewed as a potent contributor to pathogenesis. Human beings pass as perfectly well as long as they hold their tuberculous infections asymptomatic, inactive. But they are allergic, and any discharge of sufficient focal material to a new place will render them immediately ill because of the allergic reaction that ensues promptly.

This also applies to tubercle bacilli from exogenous sources.

Allergic tissues have the ability temporarily to fix or hold tubercle bacilli at or near points of lodgment. Apparently it is this fixing power which has deceived so many physicians for decades. After allergy has been artificially created and virulent tubercle bacilli are introduced, their dissemination is temporarily retarded. For example: Krause introduced tubercle bacilli subcutaneously into the groins of nonallergic guinea pigs and found that some had traveled to the lungs, tracheobronchial lymph nodes and spleen in four days or less. These animals died from tuberculosis in approximately three months. The same experiment conducted with a group of allergic guinea pigs showed that bacilli had not reached the lungs, tracheobronchial lymph nodes and spleen until three weeks to 30 days, and these animals did not die from tuberculosis until 10 to 11 months. It was the temporary fixing power of the allergy which delayed the movement of the tubercle bacilli in the allergic animals. However, the ultimate effect was the same. It is this same phenomenon which has deceived all who have attempted to produce immunity by rendering tissues allergic.

HARMLESSNESS OF BCG NOT PROVED

Although Calmette strongly maintained that BCG is harmless, we have not been able to believe that any living bacillus that was once so virulent as to cause death of animals in four to six weeks can be trusted when many millions are injected into a human body. It is now known, contrary to Calmette's belief, that the virulence of BCG changes materially. Holm says, "It is very important to keep the virulence of the BCG strain at the proper level and to watch closely the variations of its virulence." Jensen pointed out that the virulence of BCG changes and that if the strain becomes too virulent abscesses develop among those who receive it, with alarming effects. On the other hand, virulence has been found to decline so that it does not even produce allergy. Considerable effort is put forth to produce BCG of just the "right" virulence and then rush it, often by airplane, to the children who are to receive it. Not enough thought is given to how virulence of these living bacilli may change after they have been introduced into the bodies of children.

Dubos (1949) observed that three strains of BCG obtained from American collections differ significantly in their ability to produce pulmonary lesions in mice after intravenous injection. In discussing the importance of the physiological state of animals used for study, he says:

> *Thus it has been shown at the Saranac Laboratory that the strain RIRV (in many respects difficult to differentiate from BCG) causes severe disease in the silicotic guinea pig but not in normal animals. It has also been found in our laboratory that one of the BCG strains commonly used for immunization can cause severe pulmonary disease (and sometimes death) when injected in sufficient amounts into mice maintained on deficient diets.*

These facts we view with great alarm. Who knows what the physiological state is of the millions of children receiving BCG at this time. Concerning this, Dubos says:

> *It is even conceivable that many of the classes of human beings who are most dangerously exposed to tuberculosis (for example, those living under conditions of great economic stress with inadequate food supplies) may be those least capable of responding satisfactorily to immunization procedures.*

When BCG is administered subcutaneously, large abscesses at the site of injection and suppurating regional lymph nodes often occur. To avoid such extensive disease caused by BCG, Rosenthal in 1938 advocated the multiple puncture method of administration. His hope was only partially fulfilled, as such lesions still occur. For example, C. Blanch and co-workers (1948) reported 12 cases of suppurating lymph nodes complicating the administration of BCG by the puncture method. The reactions consisted of local single or multiple abscesses, infarction of lymph nodes, abscess formation and fistulization. These characteristic tuberculous abscesses ruptured and drained for many months. Sometimes they appeared eight or more months after BCG was administered. Every administration of BCG resulting in a so-called take causes necrosis in at least the deeper layers of the skin with corresponding lesions in the regional lymph nodes.

G. Wiek (1948) reported on the various lesions found in 15 children from 5 to 14 years of age who received BCG in 1945 and 1946. Pulmonary infiltrations were seen in nine; pleurisy with effusion in four; bronchial lymph node tuberculosis in one; and elimination of bacilli without demonstrable pulmonary focus in one.

The statement is made that BCG is harmless and that no case has been reported in which it has regained virulence in man. There is a sparcity of evidence in the literature to support this statement. The number of lesions removed for biopsy or at necropsy from vaccinated persons who fell ill or died from tuberculosis to determine this point apparently is almost nil.

In animals or people in whom subsequent to inoculation with BCG progressive disease has developed, one might expect that typing of the organism would promptly reveal its identity. Unfortunately, this has not been found so simple. For example, with Dreyer's virulent BCG strains, Griffith could classify them only as mammalian and thus could not determine whether they were of human or bovine type. Holm said (1946):

> After staying in the human organism for some time the bovine type of the tubercle bacilli will change in character in such a way as to be diagnosed as the human type.

UNWARRANTED CLAIMS AND PREDICTIONS

Von Behring (1902) stated that his vaccines would soon render tuberculosis a disease of only historic interest. However, in about one decade his method was discarded.

It has been stated recently that BCG is capable of controlling 60 to 80 per cent of tuberculosis. Evidence indicates that in our area this, if proved, would apply to only about 3 per cent of our problem.

Concerning tuberculosis in Japan, it was recently said: "The BCG immunization program will in the future prevent the occurrence of most of the cases of clinical tuberculosis." Such a result has never been approached anywhere by the use of a vaccine. In Japan the annual death rate from tuberculosis is reported to have decreased from 280 per 100,000 to 181.1 in recent years. This was attributed largely to the use of BCG and would be convincing evidence were it not that similar decreases have occurred in other parts of the world in the absence of BCG. Levine says:

> We are told that in Buenos Aires the tuberculosis death rate in children under the age of 15 years decreased some 72 per cent between 1924 and 1944. This decrease was attributed to BCG. This would appear to be convincing evidence were it not for the fact that during these same years the tuberculosis death rate in New York City decreased about 95 per cent without the use of vaccine.

BCG HIGHLY CONTROVERSIAL

After more than 40 years of use of BCG in animals and more than 25 years in humans, no agreement has been reached among its proponents with reference to what constitutes a good vaccine, how it should be administered, what comprises a "take" or how long it is potent. Some physicians believe that persons should be extensively exposed to contagious tuberculous patients immediately after their tissues have been made allergic by BCG, while others contend that every effort should be made to protect against reinfection with virulent bacilli for all time after BCG has been administered. Thus, BCG lacks the qualities necessary to serve the purpose that its proponents desire. If it had been proved efficacious, its proponents should have agreed on a standard procedure; moreover, its past and present opponents would have accepted it. The medical profession has never been hesitant in accepting diagnostic, therapeutic or preventive measures of proved value. Good examples are the roentgenogram in diagnosis, insulin in therapy and smallpox vaccine in prevention. At this moment there is probably nothing in medicine as highly controversial as the value, if any, of BCG. Palmer, of the United States Public Health Service (1949), says:

> First it must be admitted in clear and unequivocal terms that strict scientific proof of the efficaciousness of BCG vaccination in the control of human tuberculosis is not available.

TOO LITTLE TO GAIN—TOO MUCH TO LOSE

Analysis of the scores of reports on the use of BCG has convinced us that any possible gain would be far too slight to justify its administration to our children, students or older adults. Tuberculosis (within a year or so after infection occurs) in which benefits are claimed from BCG constitutes only about 3 per cent of our problem. There is a total lack of evidence of any efficaciousness in the remaining 97 per cent. Even in the 3 per cent group, no one has claimed complete protection. All admit that illness and death occur among the vaccinated. Thus, even in this small group (3 per cent) one could never hope to eradicate tuberculosis by the use of BCG.

Our program of tuberculosis control would have suffered great loss had BCG been adopted. The mere finding that the skin is allergic to tuberculoprotein is proof positive of the presence of at least primary tuberculous lesions, and in most cases these lesions contain living tubercle bacilli. Therefore, the tuberculin test is our most effective weapon against tuberculosis. In diagnosis it is indispensable. It is by far the finest epidemiological agent, and it is the only accurate method of determining with reasonable promptness the effectiveness of tuberculosis eradication measures.

BCG does not prevent subsequent infections with virulent tubercle bacilli. However, it renders the tissues allergic to tuberculoprotein so that they react to tuberculin, thus depriving the individual of the inalienable right to have the presence of virulent tubercle bacilli detected promptly if and when they invade his body. Current attempts to differentiate between infections with BCG and virulent tubercle bacilli by color, degree of reaction or other means do not seem promising in the light of variations in virulence of BCG.

It is contended that only experts, individually or in teams, can satisfactorily administer BCG. This eliminates the family physicians—the general practitioners—who are so needed to solve the tuberculosis problem everywhere. In our program general practitioners have done a large volume of the work. To eliminate them by introducing a procedure that they cannot properly use and depriving them of their most potent weapon, the tuberculin test, would be disastrous.

When the physician uses the words "vaccination" and "immunity," the public thinks of almost total immunity, as obtains in smallpox. Therefore, when these words are used in association with tuberculosis, a false sense of security is transmitted to the individual and the public, which may result in relaxation of proved sanitary measures. For example, persons found to have contagious tuberculosis have refused to leave their homes because they had been told that their children could be immunized against the disease. Again, those already in institutions have insisted upon leaving because they believed the vaccine would protect their children against tubercle bacilli.

The idea is extant that vaccination with such substances as BCG will so completely control tuberculosis that the need for sanatoriums will soon vanish. This is said already to have influenced legislators and others who would ordinarily promote and support repairs and additions to existing hospitals and sanatoriums and the construction of new ones when needed.

CONTROLLED STUDY IMPERATIVE

Since Calmette opposed a controlled study in France in the early 1920's, no such investigation has been conducted with sufficient care to rule out all other factors or long enough to justify dependable conclusions regarding the efficaciousness of BCG. In fact, several proponents of its use now oppose such a study on the ground that time should not be lost while waiting for facts. This is an example of enthusiasm having outrun not only due caution but judgment as well. With our present lack of knowledge of immunity in tuberculosis, it is doubtful whether such a study is possible. Dubos, of the Rockefeller Institute for Medical Research (1949) said:

> There have been endless controversies concerning the dangers and effectiveness of immunization with the BGG vaccine. Surprisingly enough, however, little has been said or written concerning the immunological basis and the technical problems involved in the preparation of the vaccine or the measurement of its protective efficacy. Opponents as well as proponents of BCG vaccination seem to accept implicitly that the technical procedures advocated by Calmette and his associates for growing the microorganism, preparing suspensions of it and assaying the development of immunity, are fundamentally adequate and need not be modified except in detail. This is a questionable assumption and there is much reason to suspect that many of the controversies elicited by BCG vaccination cannot be settled until a number of bacteriological and immunological problems have been solved. . . . It is highly desirable, therefore, that BCG preparations be standardized in terms of their ability to induce immunity against tuberculous infection. Surprisingly enough, there is as yet no well defined technique for such an assay.

These statements from such excellent authority strongly suggest that before a dependable controlled study is possible the entire subject of immunity in tuberculosis ought to be referred to competent bacteriologists and immunologists for the determination of facts that we do not now possess. The Oxford University investigators of the vole tubercle bacillus vaccine said: "To plan a controlled experiment in tuberculosis vaccination in man is a matter of so much difficulty as to be virtually impossible." Medlar states: "The difficulties of assessing the value of vaccination with BCG in experimental animals under controlled conditions emphasizes the greater difficulties encountered in experiments in man because of the existence of uncontrolled and uncontrollable conditions."

Although the handicaps to an assessment of facts are obvious, the Division of Tuberculosis of the United States Public Health Service called a Conference on BCG in September, 1946. On recommendation of this conference, arrangements were made to set up the best controlled study possible on a limited number of persons and to employ an adequate staff in order to make sure that every person was kept under close surveillance throughout the duration of the project. It was realized that this would need to be continued for 25 years and probably longer before the desired facts about BCG would be obtained. This study is now in progress, and it deserves the unstinted support of the medical profession everywhere, since it promises the best that can be done under existing circumstances.

Much of the present enthusiasm for BCG stems from a few workers in Scandinavia. In fact, Holm, through the Danish Red Cross, has directed teams in many nations in Europe, Asia, Central America and elsewhere. The mission of these teams is not only to administer BCG to millions of children and young adults but also to convince professional workers and the public everywhere of its efficaciousness. The tuberculosis situation in Denmark is comparable in most respects to that of Minnesota. The population of the two areas is nearly equal—approximately 3,000,000. A preponderance of Minnesotans are of Scandinavian ancestry. Fundamental control measures have been similarly practiced. In neither Denmark nor Minnesota was there increase in tuberculosis mortality during World War II. The significant difference is that BCG has been used in Denmark since 1927, sparingly at first but extensively over the past decade. Thus we welcomed the opportunity to compare results in Denmark and Minnesota.

In Denmark there has been an almost continuous decrease in mortality (except during World War I) since 1906. The mortality rate in 1949 was 19 per 100,000. The mortality rates graph shows no indication of sharp decrease with the use of BCG in Denmark. Thus, a fair question is whether the fundamental methods that were operating so effectively prior to the BCG era are not actually the factors responsible for the continued decrease during this era. Holm states that at the age of 14 years, about one third of the Danish population reacts to tuberculin while two thirds are reactors at 20 to 23 years.

RESULTS FROM OUR FUNDAMENTAL METHODS ALONE

As our work progressed, the theory that primary infection immunizes was frequently emphasized and it was often said that protecting children against infection would soon lead to so many "nonimmune" adults that should they then become infected they would be swept away in vast numbers by tuberculosis. Theorists argued that producing dairy products without the bovine type of tubercle bacilli would deprive children of immunity. The theory proved to be untenable. As tuberculosis among cattle was controlled almost to the point of eradication throughout the state, there followed a decline in mortality, morbidity and infection attack rates among human beings. As the infection attack rate was further decreased by protecting children and adults alike from human type tubercle bacilli, there also followed a corresponding decrease in morbidity and mortality from tuberculosis.

As uninfected children attained adulthood they presented no tuberculosis problem. Those, such as students of nursing and medicine, who became infected as adults, controlled primary lesions in the same manner as those who had been infected in childhood. We have not observed that primary infections in adults are more dangerous than in children or that a considerable number of the cases of tuberculosis in adults are closely related in point of time to primary infection. Thus, the theory that producing "virgin soil" in human beings would later result in disaster has proved to be a myth.

Theorists maintained that in such situations as obtain in schools of nursing and medicine and in general hospitals it was impossible to prevent exposure to tubercle bacilli. Hence the term "unavoidable exposure" was coined. When the fundamental method of control was applied, it was found practically as effective in such institutions as in the general population. In our school of medicine, in which up to 65 per cent of those who entered as nonreactors to tuberculin became reactors and 4 to 10 per cent acquired demonstrable lesions before graduation, the infection incidence was reduced to 3 per cent, and seven years have elapsed with development of a demonstrable lesion in only one student.

In a school of nursing from which no student had escaped infection and in which from 12 to 19 per cent presented demonstrable lesions before graduation, the infection attack rate was reduced to zero in the graduating class of 1945, and in only one student has a lesion been detected by roentgen shadow in the past seven years. No school of medicine or nursing has reported comparable results from BCG.

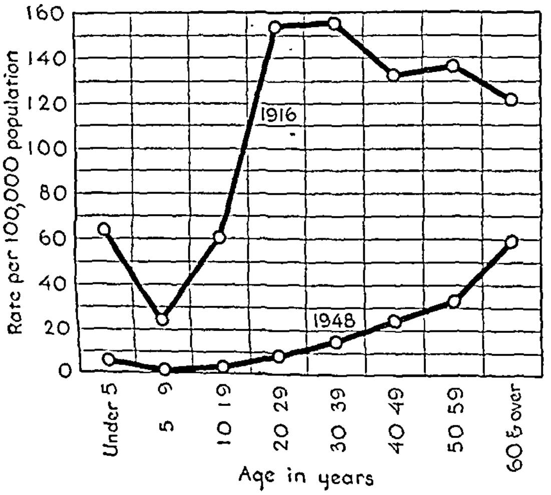

Chart 3.—Marked reduction in mortality rates among persons at various ages between 1916 and 1948. This was accomplished by fundamental methods of tuberculosis control in the absence of BCG.

American Indians have been spoken of as highly susceptible and exposure among them is "unavoidable." We have not found Minnesota Indians more susceptible than Caucasians, nor has infection been unavoidable among them. They have responded to fundamental control methods exactly as have the Caucasians. What was thought to be susceptibility was the result of neglect. When fundamental methods were instituted, the response was remarkable. For example, in 1937 there were 64 deaths (mortality rate 529.2) among our 12,500 Indians, but in 1949 only 9 (rate 71.8) died. Although BCG has been extensively used among Indians in some states, we know of no result comparable to that achieved in this state where it has not been employed.

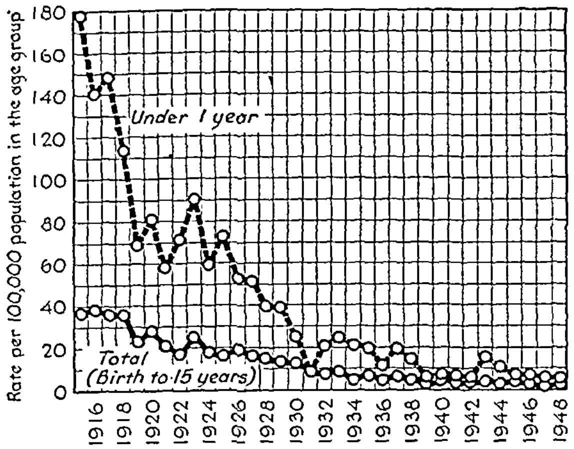

Chart 4.—Marked decrease in the tuberculosis mortality rates among children from 1916 to 1948. This was accomplished without the use of immunizing agents.

Application of the same fundamental methods accomplished other excellent results. For example, by 1935 the veterinarians had tuberculosis among cattle so well controlled that the entire state was accredited. In 1949 only 0.09 per cent of the cattle reacted to tuberculin.

Waiting lists in sanatoriums decreased until many vacant beds now exist because of the lack of patients. There was a tumbling down of mortality, morbidity and infection attack rates from year to year (Chart 3). In this state the tuberculosis mortality rate dropped from 106.1 (2,400 deaths) in 1916 to 13.6 (410 deaths) in 1949. Among the 410 who died that year, 63.2 per cent were 50 years old or over and 31.5 per cent were 65 or older.

In 1916 there were 68 deaths (mortality rate 140.4) among babies under 1 year old. This was reduced to 3 deaths (rate 6.3) in 1948, and to 2 (rate 4.4) in 1949. In 1916 among children from birth to 15 years 275 (rate 38.3) died of tuberculosis, but only 19 (rate 2.6) died in 1948 and 9 (rate 1.3) died in 1949 (Chart 4). While 268 (rate 60.4) from 10 to 19 years died in 1916, only 14 (rate 2.8) died in 1948, and 7 (rate 1.4) died in 1949.

In the entire state the infection attack rate has been reduced to less than 0.3 per cent per year. By 1944 in Minneapolis only 7.7 per cent of grade school children had primary tuberculosis (tuberculous infection), against 47.3 per cent in 1926. By 1948 there were large numbers of schools in rural counties in which no child reacted to tuberculin. Among high school students in the largest city approximately 12 per cent and in other parts of the state rarely more than 8 and often less than 4 per cent now react to tuberculin. By 1945 only 6.4 per cent of students entering the University of Minnesota were infected with tubercle bacilli.

SUMMARY AND CONCLUSIONS

Fundamental methods of controlling tuberculosis consist of treating it as a contagious disease and thus preventing bacilli from invading the tissues of people and animals. This necessitates the use of the tuberculin test, x-rays, the microscope, culture mediums, animal inoculation and other procedures, as well as isolation and treatment of patients with contagious disease in hospitals and sanatoriums. Scores of physicians have long sought methods of artificially produced dependable immunity for tuberculosis. None have succeeded, probably because natural infection with virulent tubercle bacilli does not result in dependable immunity. BCG is a living bovine type bacillus of reduced virulence. In culture mediums its virulence fluctuates significantly. When introduced into human tissues, it causes tuberculous lesions which may come under control in a few months. In some cases abscesses develop and regional lymph nodes discharge pus for many months. BCG causes progressive and killing tuberculosis in silicotic animals as well as those on deficient diets. The amount of scientific work reported to prove its harmlessness in man is almost nil. BCG or vole tubercle bacillus vaccine renders the tuberculin reaction useless as a diagnostic and epidemiological agent and diminishes or even eliminates much necessary public support by creating a sense of false security in the minds of the people.

The tuberculin reaction is not a criterion of the presence of immunity. This reaction indicates only the presence of allergy, which is a prerequisite for development of clinical forms of tuberculosis. No method of identifying or measuring immunity or resistance to tubercle bacilli is available. Most observations on BCG have been limited to those conditions that occur within a year or two after allergy is established by natural infection. Here it is said to be 60 to 80 per cent efficacious. These conditions constitute only about 3 per cent of our problem. There is no evidence that it has any value in the remaining 97 per cent.

No scientific adequately controlled study of BCG has ever been conducted over a sufficient period of time to justify conclusions regarding its efficaciousness. It is doubtful whether such a study is possible in persons living in their homes. However, the serious effort now being made by the Division of Tuberculosis of the United States Public Health Service deserves unstinted support of the medical profession.

The use of fundamental methods exclusively over the last 30 years has resulted in control of tuberculosis among our students of nursing and medicine, American Indians, the general public and domestic animals that has never been remotely approached anywhere by the use of an immunizing agent. These methods when properly executed are sure of accomplishment. At the present time they afford our only hope of eradicating tuberculosis.

915 S. Seventh St.

SYPHILIS AND GONORRHEA AS CAUSES OF BLINDNESS

A STUDY OF PERSONS DECLARED LEGALLY BLIND IN OHIO

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This paper is a report of some findings concerning the role of syphilis and gonorrhea as etiological factors among persons declared legally blind in Ohio. Also considered are other aspects of syphilis and gonorrhea in blindness, including the topographical and pathological classifications of those persons whose blindness was caused by venereal disease, together with race and sex distribution of the venereal blind and observations on the age at which such persons become blind.

Financial assistance and vocational rehabilitation for blind persons in Ohio is a function of the Ohio Department of Welfare. Through the cooperation of that department and with the assistance of its Division of Research and Statistics, basic statistical data presented in this study were especially tabulated at our request and were made available to the Division of Communicable Diseases of the Ohio Department of Health. The tables presented in this study were constructed by us from the special tabulations mentioned above. We were specifically interested in bringing to light all possible information related to the role of venereal disease in blindness. The statistics of the Ohio blind are tabulated according to the standard classification of causes of blindness as recommended by the Committee on Statistics of the Blind, jointly sponsored by the American Foundation for the Blind and the National Society for the Prevention of Blindness.

When an Ohio resident applies for financial aid, he is examined by a local ophthalmologist, who reports the results of the examination on a standard form. The ophthalmologist's report is then reviewed by a consultant ophthalmologist retained by the state, and a decision is made as to whether the applicant is legally blind and entitled to financial assistance. The definition of legal blindness in Ohio is as follows: "Legal blindness is said to exist in an individual who with his better eye after correction has 20/200 vision or less, or has his field of vision reduced to a diameter of less than 20 degrees. It is also said to exist in any individual who after the removal of the lens from his eye has 20/70 vision or less."

Chief, Division of Communicable Diseases, Ohio Department of Health (Dr. Freeble).

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This definition was adopted by the Ohio Department of Welfare from certain standards suggested in the "Manual on the Use of the Standard Classification of Causes of Blindness" as published by the Committee on Statistics of the Blind.

Table 1.—*Etiology of Blindness in Ohio by General Classification, Jan. 1, 1939 Through Dec. 31, 1948*

General Classification	No.
Infectious diseases	852
General diseases	650
Prenatal origin	502
Trauma	326
Neoplasms	73
Poisonings	24
Undetermined or not specified	4,015
	6,442

SYPHILIS AND GONORRHEA AS CAUSES OF BLINDNESS

In the 10 year period from Jan. 1, 1939 through Dec. 31, 1948, there were 6,442 persons declared legally blind in Ohio. Etiology by general classification is shown in table 1. It will be noted that the largest group in the general classes involves cases in which the etiology was undetermined or not specified. This general group includes "unknown to science," "undetermined by physician," and "not specified." In many of these cases in Ohio, the blind person reported for his first examination many years after the onset of the condition that caused his blindness, and the examining ophthalmologist was unable to determine the etiological basis. However, this group also includes persons in whom the physician either did not take the trouble to establish a diagnosis or, if he did, failed to report his findings on the examination form. Other studies in blindness have been confronted with this same problem of having many cases of undetermined etiology.

When the 4,015 cases with undetermined etiology are deducted from the total, there are 2,427 cases of legal blindness in Ohio in which the cause was determined. Among the cases with known causes, infectious diseases were responsible for the greatest number, namely, 852 cases. Of the total number whose blindness was caused by infectious diseases, syphilis was the etiological factor in 507 cases, which represents 59.5% of all legal blindness due to infectious diseases (table 2). Thus it is evident that among presumably preventable diseases causing blindness in Ohio, syphilis leads all others. Table 2 shows the total 852 cases of legal blindness caused by infectious diseases, with the number of cases contributed to the total by each specific disease.

Table 2.—*Blindness in Ohio from Specific Infectious Diseases, Jan. 1, 1939 Through Dec. 31, 1948*

Syphilis	507 *
Trachoma	99
Ophthalmia neonatorum	68 †
Tuberculosis	50
Meningitis	23
Measles	15
Septicemia	14
Smallpox	6
Scarlet fever	5
Diphtheria	5
Gonorrhea	2
Other infec[illegible] specified	58
	852

* Of the 507 cases of syphilis, 35 cases were specified as "congenital syphilis," 31 as "acquired syphilis," and 441 as "syphilis—type not specified."

† Includes 23 cases specified as gonococcal, 40 type not specified, and 5 other types specified.

When only those cases are considered whose blindness was definitely attributed to syphilis, we find that the 507 syphilitics comprise 7.9% of the total 6,442 cases, which include the 4,015 cases with undetermined or unspecified etiology. From another point of view it may be considered that the 507 cases with syphilis account for 20.9% of the total 2,427 legally blind among whom the etiology was determined. It is also reasonable to assume that a considerable percentage of the 4,015 cases whose etiology was undetermined was caused by syphilis. If the assumption is made that the distribution of etiological factors among the 2,427 cases of known etiology is a good sample of the distribution of cases among the total number of legally blind in Ohio, one could arrive at the conclusion that about one-fifth of all blindness in the state is caused by syphilis. The validity of such an assumption has several aspects. Some ophthalmologists feel that syphilis is probably underreported. Cowan and English,[1] for example, in discussing their series of 31,352 eyes, in which the etiology was determined in 20,763 eyes, state: "We have 10,732 cases in which syphilis might have been an etiologic factor, yet it is noted as a factor in only 1,484 reports." On the other hand, it may be argued that laboratory tests for syphilis are simple, fairly accurate, and in wide use among physicians and that most syphilis among blind persons is diagnosed. Another interesting fact in the literature concerning this aspect of the role of syphilis in blindness is found in Berens' and Goldberg's [2] statement "laboratory examinations showed that Wassermann tests were made in only 2,237 (37.5%) of the 5,969 cases in which the diagnosis was an eye disease of possible syphilitic origin."

Table 3.—*Ten Leading Specific Causes of Legal Blindness in Ohio, Jan. 1, 1939 Through Dec. 31, 1948*

Syphilis	507 *
Prenatal origin	502
Diabetes	331
Trauma	326
Vascular disease	147
Trachoma	99
Neoplasms	73
Ophthalmia neonatorum	68 †
Tuberculosis	50
Poisonings	24
	2,127

* Of the 507 cases of syphilis, 35 cases were specified as "congenital syphilis," 31 as "acquired syphilis," and 441 as "syphilis—type not specified."

† Includes 23 cases specified as gonococcal, 40 type not specified, and 5 other types specified.

The relative importance of gonorrhea among infectious diseases causing blindness is not apparent. As may be seen in table 2, ophthalmia neonatorum as a disease entity ranked third among the infectious diseases causing blindness. Of the 68 cases ascribed to this cause, 23 were specified of gonococcal origin, and five to other specific types. The remaining 40 cases were classified as "ophthalmia neonatorum—type not specified." The preponderance of gonorrhea among those cases in which type was specified, coupled with past medical experience and the fact that in past nomenclature the terms ophthalmia neonatorum and gonorrheal ophthalmia were practically synonymous, would lead us to believe that a substantial percentage of the 40 cases in which type was not specified was in fact gonococcal in origin. Nevertheless, when the 23 cases specified as of gonococcal origin are considered alone (which is, of course, a minimum figure), gonorrheal ophthalmia appears as an important cause of blindness due to infectious diseases. On the other hand, it should be noted that gonorrhea, excluding gonorrheal opththalmia neonatorum, was responsible for only two cases of blindness during the 10 year period.

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[1] Cowan, A., and English, R. C.: Causes of Blindness in Pennsylvania: Analysis of Blindness in over 30,000 Eyes, Arch. Ophth. **26**: 797 (Nov.) 1941.

[2] Berens, C., and Goldberg, J. A.: Syphilis in Relation to Prevention of Blindness: A Study of 100,000 Case Records, J. A. M. A. **109**: 777 (Sept. 4) 1937.

The 10 leading causes of legal blindness (where the cause was determined and specified) are shown in table 3. Syphilis ranks first among the 10 leading specific causes of blindness in Ohio. It is striking to observe that infectious diseases, which are presumably preventable, account for four of the 10 leading causes of blindness. It may be noted also that the ophthalmia neonatorum group, which includes at least 23 cases of gonococcal origin, ranks eighth among the 10 leading causes. As an observation on "prenatal origin," which ranks second in table 3, Berens, Kerby and McKay [3] in their study on blindness among 27,002 school children indicated that syphilis is probably responsible for a large proportion of the blindness now classified as congenital or hereditary. If this latter point is true, blindness due to syphilis would loom even greater than is evidenced by the information at hand.

TABLE 4.—*Number and Percentage of Cases of Legal Blindness Due to Syphilis by Year, Jan. 1, 1939 Through Dec. 31, 1948*

Year	Total No. (All Causes)	No. Caused by Syphilis	Percentage Due to Syphilis
1939	677	78	11.5
1940	726	89	12.3
1941	732	56	7.7
1942	602	33	5.5
1943	468	14	3.0
1944	380	26	6.8
1945	443	22	5.0
1946	595	56	9.4
1947	701	46	6.6
1948	1,118	87	7.8
	6,442	507	7.9

Table 4 shows the number and percentage of cases of legal blindness due to syphilis by year from 1939 through 1948. In interpreting table 4, one should keep in mind that the percentage of cases caused by syphilis each year is a minimum figure, since each annual total includes many cases in which the etiology was undetermined or unspecified.

Despite approximately 10 years of intensive venereal disease control activities aimed primarily at syphilis, the table shows no consistent downward trend in the percentage of blindness due to syphilis. Although there was a downward trend during the first five years of the 10 year period, the minimum percentage was reached during 1943. Considerably higher percentages have occurred in each of the five years since 1943. The percentage of blindness due to syphilis from 1939 through 1943 was 8.4. The percentage for the five years from 1944 through 1948 was 7.3. Although the most recent five year average percentage was lower, the difference was not statistically significant. On the other hand, the 7.9% of blindness due to syphilis in the 10 year period under discussion was higher than that indicated by statistics available for several years prior to 1939, during which period syphilis was responsible for 7.1% of all blindness in Ohio (table 5). The latter difference was not significant either, however.

TABLE 5.—*Legal Blindness Caused by Venereal Disease in Ohio Before 1939 and During Jan. 1, 1939 Through Dec. 31, 1948*

Cause of Legal Blindness	Before 1939		1939 thru 1918		Both Time Periods	
	No.	%	No.	%	No.	%
All causes	3,137	100.0	6,442	100.0	9,579	100.0
All venereal diseases	252	8.0	532	8.3	784	8.2
Gonorrhea excluding ophthalmia neonatorum	3	0.1	2	0.03	5	0.05
Gonorrheal ophthalmia neonatorum	26	0.8	23	0.4	49	0.5
Syphilis	223	7.1	507	7.9	730	7.6

As to the role of gonorrheal ophthalmia neonatorum as a cause of blindness, the 23 cases in the 10 year period accounted for 0.4% of the total 6,442 cases. This represents a significant decrease as compared to the years before 1939 when gonorrheal ophthalmia neonatorum contributed 26 cases, or 0.8% of a total of 3,137 cases declared legally blind from all causes. There has been an even greater decrease in "ophthalmia neonatorum type not specified" since 1939. This classification (not shown on table 5 because the origin was not specified), which undoubtedly included many cases of gonococcal origin, decreased as the etiological cause of blindness from 3.1% of the total cases before 1939 to 0.6% in the 10 year period from Jan. 1, 1939 through Dec. 31, 1948.

TABLE 6.—*Comparison of Syphilis as an Etiological Factor in Blindness in Ohio and Other Areas*

Area	Total No. of Cases in Study	Cases with Etiological Factor Determined	Caused by Syphilis		
			No.	% of Total No. of Cases in Study	% of Cases with Etiological Factor Determined
Ohio	6,442	2,427	507	7.9	20.9
Pennsylvania [1]	31,352 *	20,763 *	1,843 *	5.9	8.9
Canada [4]	12,652	5,703	518	4.1	9.1
Massachusetts [5]	1,176	713	128	10.9	18.0
Minnesota [6]	768	563	84	10.9	14.9
Scotland (Brit. J. Ophth. *38: 381, 1946*)	7,297	7,150	730	10.0	10.2
Kentucky [8]	1,901	1,037	130	6.8	12.6
Texas (Texas State J. Med. *41: 519, 1946*)	6,106	1,742	411	6.7	23.6
	67,694 †	40,096 †	4,351 †	6.4 †	10.9 †

* These figures are based on the number of eyes, not the number of cases.

† Includes all cases (and eyes) in the eight studies.

It might be well to compare the Ohio figures with reported findings in other areas. Table 6 illustrates the various data concerning the percentage of all blindness due to syphilis as compared to all causes including undetermined etiology. This percentage ranges from 4.1% in the Canadian study [4] to 10.9% as determined in the

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[3] Berens, C.; Kerby, C. E., and McKay, E. C.: The Causes of Blindness in Children: Their Relation to Preventive Ophthalmology, J. A. M. A. **105**: 1949 (Dec. 14) 1935.

[4] Aylesworth, F. A.: A Study of Blindness in over 12,000 Cases in Canada, Canad. M. A. J. **54**: 30 (Jan.) 1946.

Massachusetts[5] and Minnesota[6] studies. The average percentage of blindness due to syphilis as compared to all causes, including unknown etiology, was 6.4 for the eight studies combined.

AGE, SEX, AND RACE FACTORS

This section is devoted to the age, sex, and race factors of persons in our series whose blindness was caused by venereal disease. The data presented represent all cases of legal blindness in Ohio whose medical records have been coded by the Department of Welfare. They include all the cases in the 10 year period previously discussed, plus cases from 1938 and before, as shown in table 5. Coding and punching under the standard classification of Statistics of the Blind was instituted in Ohio in 1938. At that time, the backlog of cases declared legally blind during 1938 and before were coded and punched according to the standard classification, but all these pre-1939 cases were grouped together in the category of "1938 and before." The exact year was not identified. The total number of cases of legal blindness in this period before Jan. 1, 1939, was 3,137 as shown in table 5. Of this early group, 223 (7.1%) were attributed to syphilis, 26 (0.8%) to gonorrheal ophthalmia neonatorum, 97 (3.1%) to ophthalmia neonatorum type not specified, and 3 (0.1%) to gonorrhea, excluding gonorrheal ophthalmia neonatorum. Addition of these pre-1939 data to the information previously discussed shows a total of 784 legally blind persons whose disability was caused by venereal disease among all persons declared legally blind for whom records were maintained. Inasmuch as "ophthalmia neonatorum type not specified" has an unknown percentage due to the gonococcus, this group is not included in the 784 cases.

TABLE 7.—*Race and Sex Distribution of 784 Cases of Blindness Caused by Venereal Disease, Before 1938 Through Dec. 31, 1948*

	White		Negro		Other		
Venereal Disease	Male	Female	Male	Female	Male	Female	Total
Gonorrhea excluding ophthalmia neonatorum	3	1	1	0	0	0	5
Gonorrheal ophthalmia neonatorum	18	4	22	3	0	2	49
Syphilis	313	150	149	78	31	9	730
	334	155	172	81	31	11	784

Table 7 presents the sex and race breakdown of these cases for each venereal disease. We perhaps should mention here that, although the standard classification of blind statistics has a separate category for congenital and acquired syphilis, we found that relatively few cases of syphilis were so classified and that the majority were classified as "syphilis—origin not specified." We have therefore combined congenital, acquired, and type not specified, and present them as total syphilis cases.

Regardless of race, the number of males whose syphilis resulted in blindness outnumbers the females two to one. It is believed that this apparent sex difference is due to the fact that the males, being the breadwinners, are likelier to apply for financial assistance, rather than any real difference in syphilis predisposing to blindness according to sex. It should be noted here that there is a difference of opinion expressed in the literature concerning the sex distribution for all causes of blindness. Marshall and Seiler[7] reporting a series of persons applying for pensions for the blind in certain areas in Scotland stated, "It is evident there is little difference in the incidence of blindness between the sexes, and the total number of males 2,015, and females 2,063, nearly conforms to the proportion of each sex in the population." They further state, however, that the etiological factors being separately considered, acquired syphilis causes more blindness in males than females, and that blindness due to congenital syphilis, on the other hand, is commoner among females than males. (It should be noted here that in the Ohio figures in which type of syphilis was specified males predominated more than two to one in both prenatal and acquired syphilis categories.) In direct contrast to the Scotland study, Sory and Caudill[8] in their article "The Cause and Distribution of Blindness in Kentucky Among Recipients of Aid to the Needy Blind" state that "males go blind almost twice as frequently as females."

According to the 1940 census, the ratio of whites to Negroes in Ohio was 19 to 1. All other things being equal, one would expect that the ratio of whites to Negroes blinded by syphilis in this study would be the same, 19 to 1. However, as table 7 indicates, the ratio of whites to Negroes blinded by syphilis is approximately two to one for both males and females. For an estimation of the number of white and Negro syphilitics in Ohio, selective service race specific seropositivity rates were applied to the Negro and white population totals based on the 1940 census. The resulting estimates were, of course, only approximate but serve our purpose here. We were interested to observe that in the syphilis prevalence estimates by race, calculated in this manner, white syphilitics outnumbered Negro syphilitics by about two to one. This same proportion, two to one, is evidenced in table 7, which shows the number of white syphilitics blinded by their disease as compared to the number of Negroes similarly affected. From these proportions and prevalence estimates, it would appear that race is not a factor in blindness as a complication of syphilis.

Age at loss of sight due to syphilis is presented by race and sex in table 8. It occurs to us that it may be well to stress again the fact that the examining ophthalmologists in our series did not routinely specify the type of syphilitic infection causing the blindness. In most cases the type of syphilis was called "syphilis—type not determined," and only a very small percentage was specified as congenital or acquired. For this reason the entire group is shown in table 8 as total syphilis without regard for type, and the 730 represent the entire series blinded by syphilis in the period under discussion. It may be logical to assume that the 30 cases under 2 years of age were caused by congenital syphilis. Furthermore a majority of the 58 cases between 2 and 20 years of age were no doubt also caused by congenital syphilis. On the other hand, it seems to us that most of those cases 20 years and over were probably caused by acquired syphilis, since congenital syphilis would, as a rule, have resulted in blindness before the patients reached the age of 20. One should note that 216 of the persons were of unknown age at time of loss of sight. Once again this lack of the age at which blindness occurred points to the fact that statistics of the blind are far from perfect and that examining physicians should attempt to determine and record better histories. From a review of the table in the earlier age groups in which congenital syphilis was most probably the factor, it would appear that there are two age ranges at which blindness is likelier to be manifested, one being the category under 2 years of age and the second period beginning at about 8 years of age.

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[5] Riemer, H. B. C.: Topographic and Etiologic Study of 1,176 Indigent Blind Persons in Massachusetts: Basis for Prevention of Blindness, Arch. Ophth. **32**: 304 (Oct.) 1944.

[6] Stanford, C. E.: Causes of Blindness in Minnesota, Minnesota Med. **24**: 1 (Jan.) 1941.

[7] Marshall, J., and Seiler, H. E.: Statistical Analysis of 3,219 Persons Certified Blind at Regional Clinic for Certification of Blind, Glasgow and South-West Scotland During 1929-1935, Brit. J. Ophth. **26**: 337 (Aug.); 386 (Sept.); 433 (Oct.) 1942.

[8] Sory, R., and Caudill, F. W.: The Causes and Distribution of Blindness in Kentucky Among Recipients of Aid to the Needy Blind, Kentucky M. J. **44**: 255 (Aug.) 1946.

Assuming that persons 20 and over were, by and large, blinded by acquired syphilis (and excluding those persons who lost their sight before the age of 20 and the unknown group), we calculated the median age at loss of sight for each race-sex group as well as for the total. These averages were as follows: white males 42.42 years, white females 45.25 years, Negro males 41.75 years, and Negro females 36.88 years. The total white and Negro median was 42.42 years.

In order to arrive at the time lapse for an infection of syphilis to progress to the complication of blindness, we computed the median age of infection of primary and secondary syphilis reported in Ohio from the annual reports of the Ohio Department of Health. Median ages in reported infections of primary and secondary syphilis in Ohio were as follows: white males 28.08 years, white females 24.57 years, Negro males 24.96 years, Negro females 23.50 years, with a total for all races and sexes of 25.04 years. In comparing the median age at loss of sight of persons blinded by syphilis with the median ages of reported primary and secondary syphilis infections in the state, we established an average time period of 17.38 years between the median age of infectious syphilis cases and the median age at which the loss of sight occurred. This difference suggests that an average of 17⅓ years is required for primary and secondary syphilis to progress to syphilitic blindness among infected persons fated to have the latter complication. The 17⅓ year differential is for all races and sexes and ranges from about 13 years among Negro females to almost 21 years among white females.

TABLE 8.—*Syphilis as a Cause of Legal Blindness in Ohio by Race, Sex, and Age at Loss of Sight, Before 1938 Through Dec. 31, 1948*

Age at Loss of Sight, Yrs.	White		Negro		Other		
	Male	Female	Male	Female	Male	Female	Total
Under 2	10	3	11	5	1	0	30
2 to 3.9	0	2	3	0	0	0	5
4 to 5.9	2	1	3	0	0	0	6
6 to 7.9	2	3	4	0	0	0	9
8 to 9.9	5	0	6	0	0	0	11
10 to 14.9	6	0	6	1	0	0	13
15 to 19.9	8	1	3	2	0	0	14
20 to 24.9	9	4	5	3	0	1	22
25 to 29.9	12	9	8	7	0	0	36
30 to 34.9	32	10	15	11	0	0	68
35 to 39.9	23	19	9	4	•2	1	58
40 to 44.9	31	11	10	8	0	0	60
45 to 49.9	19	20	9	2	3	0	53
50 to 54.9	23	18	7	4	0	0	52
55 to 59.9	19	9	10	3	1	0	42
60 and over	14	8	8	3	0	2	35
Unknown	98	32	32	25	24	5	216
	313	150	149	78	31	9	730

TABLE 9.—*Primary Pathological Factors in 730 Cases of Syphilitic Blindness*

	No.
Optic nerve atrophy	494
Keratitis, interstitial	76
Chorioretinitis	29
Other affections of the cornea, specified	14
Iridocyclitis and uveitis	14
Choroiditis	12
Cataract	11
Hypertension (glaucoma)	9
Keratitis, unspecified	9
Retinitis	7
Optic neuritis (papillitis)	6
Keratitis ulcerative	5
Ulceration and vascularization	5
Affections of the cornea not specified	5
Iritis	5
Retinal degeneration (includes retinitis sigmentosa)	5
Disorganized eyeball (atrophic globe and phthisis bulbi)	4
Other affections of the choroid and retina, specified	3
Myopia	2
Other affections of the lens, specified	2
Affections of the choroid and retina, not specified	2
Vitreous (excluding sequellae of known ocular disease)	2
Other specified pathology	9
	730

PRIMARY PATHOLOGICAL FACTORS

In addition to the previous information concerning the 730 persons blinded by syphilis, data were also tabulated on the primary pathological factors contributing to blindness as a result of syphilis. These data are presented in table 9.

Classified nomenclature of pathological factors by site and nature of affection as recommended by the Committee on Statistics of the Blind is used in the presentation of the information. Again it is well to point out that an adequate breakdown between congenital and acquired syphilis was unavailable in our series, and for this reason the 730 cases shown in table 9 include pathological conditions resulting from both congenital and acquired syphilis.

It will be noted that optic nerve atrophy is by far the greatest primary pathological factor in blindness due to syphilis. In our series, 494 cases (67.7%), or more than two-thirds of the total 730 cases, were made blind by optic nerve atrophy. It might be noted here that this percentage of optic nerve atrophy as the pathological factor among syphilitic blind has been reported by Klauder, Meyer, and Gross [9] to be 90%. The second specific pathological cause of blindness due to syphilis is interstitial keratitis, which was responsible for 76 cases, or 10.4% of the total 730 cases. In 38 additional persons, the pathological condition was located in the cornea (including ulcerative keratitis, keratitis not specified, ulceration and vascularization, and other affections of the cornea specified and unspecified). This brings the total number of cases whose pathological process was located in the cornea to 114, or 15.6% of the total.

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[9] Klauder, J. V.; Meyer, G. P., and Gross, B. A.: Syphilitic Primary Atrophy as a Cause of Blindness: Importance of Early Diagnosis, Am. J. Syph. Gonor. & Ven. Dis. 32: 574 (Nov.) 1948.

It is probably reasonable to assume that most of the persons blinded by optic nerve atrophy were suffering from acquired syphilis and that the majority of the persons blinded by interstitial keratitis were victims of congenital syphilis.

Table 10 presents the topography of pathology by general anatomic site of the 730 cases in the series. Although almost 85% of the persons were blinded by pathology located in the optic nerve, visual pathway, cortical visual center, or the cornea, it is apparent that the disease is also capable of attacking and destroying the function of all other parts of the eye. The latter point indicates again that the physicians should consider all structures of the organ of vision when examining for manifestations of syphilis in the eye.

COMMENT

In analyzing the data concerning persons declared legally blind in Ohio, we were most impressed to learn that syphilis was first among the 10 specific causes, and that one out of every five blind persons in whom the etiological factor was known was blinded by syphilis. It is to be expected that a lag would exist between improved treatment methods and the appearance of a downward trend in the incidence of syphilitic blindness. However, it must be remembered that prior to the advent of the antibiotic era, syphilis was one of the few diseases for which specific therapy was available. This fact coupled with the availability of simple and reasonably accurate laboratory diagnostic aids and a wealth of clinical experience should have brought about a decreasing incidence of syphilitic blindness. The advent of penicillin therapy and intensive venereal disease control activities during recent years should be adding impetus to this decline. Syphilitic mortality, psychoses, and cardiovascular manifestations have been reported to be declining in incidence, yet it would appear that syphilis as a cause of blindness in Ohio has not perceptibly declined.

TABLE 10.—*Topography of Pathology in 730 Persons Blinded by Syphilis by General Classification*

Anatomic Site	No.	Percentage
Optic nerve, visual pathway and cortical visual center	502	68.8
Cornea	114	15.6
Choroid and retina	59	8.1
Iris and ciliary body	21	2.9
Eyeball in general	19	2.6
Crystalline lens	13	1.8
Vitreous	2	0.3
	730	100.0

Our study suggests that an average 17 year period exists between initial infection and loss of sight, which would indicate sufficient time for the medical profession to diagnose and adequately treat these persons in order to prevent the appearance of this complication in a large percentage. This certainly presents a strong argument for intensive case-finding activity not only for the infectious stages of the disease, but also for those persons with hitherto unsuspected latent syphilis. The implied financial loss to both the person and the taxpayer who must support the afflicted is in itself another strong argument for intensification of syphilis case-finding and treatment activities by public health agencies, as well as by individual practicing physicians, in an application of the principles of preventive medicine.

Certainly there are few persons who do not consult physicians at least once in any given 17 year period of their lives. It is impossible to estimate how many of the 730 persons now blind because of syphilis would have normal vision today had their physicians maintained a high index of suspicion for the disease. Undergraduate and postgraduate medical training should be revised to include added emphasis on the diagnosis and treatment of syphilis.

Routine serologic tests assume added significance. These same 730 blind persons might have obtained an earlier diagnosis as a result of tests done for employment, hospital admission, or in accordance with premarital and prenatal laws. Premarital and prenatal examinations for syphilis have provided an effective screening process but are obviously not enough, for they are but isolated episodes in a person's life. Certainly detection of syphilis prior to the development of complications cannot be done by legislation but must be done by every practicing physician in rendering good medical care. Our study also reaffirms the findings of others that the lack of adequate recorded information seriously hampers efforts at analysis of the problem. We do feel, however, that certain valuable information is apparent.

The 7.9% of legal blindness in Ohio caused by syphilis represents a minimum figure, because many of the persons in whom cause was not specified or for whom the cause was attributed to "prenatal origin" undoubtedly were also blinded by syphilis. The figure quoted indicating that syphilis accounted for 20.9% of those persons in whom the cause of blindness was specified perhaps represents a more realistic estimate of the size of the problem.

The proportion of males to females, we believe, is of little importance as reported in the text, but the impression that race is not a predisposing factor to syphilitic blindness is valid from the evidence at hand. The preponderance of optic nerve atrophy and interstitial keratitis as pathological factors in blindness due to syphilis confirms findings reported previously in the literature.

SUMMARY

When the 6,442 persons declared legally blind during the 10 year period (Jan. 1, 1939 through Dec. 31, 1948) in whom the etiology of blindness was known were considered by general classification, infectious diseases ranked first among the general classes of causes of blindness. Among the 852 persons whose blindness was caused by infectious diseases, 507, or 59.5%, were blinded by syphilis.

Syphilis ranks first among all causes of blindness. The 507 persons blinded by syphilis represent 7.9% of all persons declared legally blind in Ohio during the 10 year period under consideration, including the large group of persons with blindness of undetermined or unspecified etiology. They, in addition, represent 20.9% of the total 2,427 legally blind among whom the etiology was determined, indicating that among those in

whom the etiological factors are known, one out of every five persons declared legally blind is blinded by syphilis.

When the percentage of persons declared legally blind because of syphilis is considered by year over the 10 year period of 1939 through 1948, no significant decrease in percentage is noted despite the fact that intensive venereal disease control activities were in effect in Ohio during the same years.

The percentage of blindness due to gonorrheal ophthalmia (0.4%) during the 10 year period under consideration is significantly lower than the percentage due to this cause (0.8%) in the several years prior to 1939.

Our study is compared in table 6 with seven other studies abstracted from the literature in order to present a composite picture of syphilis as a cause of economic blindness.

The study presents observations concerning age, sex, race, and pathological factors on 784 persons blinded by venereal disease among a total of 9,570 persons who have been declared legally blind in the state of Ohio and for whom records exist. Among persons blinded by syphilis considered in the study, males outnumber females by more than two to one. This apparent sex difference is more than likely due to the fact that the males, being the breadwinners, are more prone to apply for financial assistance rather than any difference in venereal disease predisposing to blindness according to sex. The ratio of whites to Negroes among persons blinded by syphilis considered in the study was approximately in proportion to the estimated prevalence of syphilis within each race group, which would suggest that race is not a factor in blindness as a complication of syphilis.

In a review of morbidity statistics for primary and secondary syphilis in Ohio, the median age was established at 25.04 years. Comparison of this figure with the median age at loss of sight (42.42 years) of presumably acquired syphilis cases considered in the study indicates that the infection requires an average period of time of 17.38 years to progress from the initial infection to loss of sight among those persons fated to be blinded by their disease.

The pathological factor in 67.7% of the persons blinded by syphilis was optic atrophy. Interstitial keratitis accounted for 10.4% of the total. Pathological factors in the remaining persons in the series were widely scattered as to topography and type of affection.

Throughout the study, obvious deficiencies in information were noted, indicating again that for purposes of analysis of the problem, accurate medical records must be maintained, including past medical histories and results of physical examinations, as well as accurate diagnoses.

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FATAL INJURIES IN COMPETITIVE SPORTS

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The recent deaths of two professional boxers from injuries sustained in boxing bouts stimulated a survey of similar fatalities in this sport and in other athletic competitions. The purpose of the survey was to determine the type and frequency of the injuries and to correlate them with the particular kind of athletic activity. Accordingly, these deaths may best be considered under the following classifications: (1) sports characterized by body contact—football, wrestling, boxing, hockey and basketball; (2) sports in which missiles are thrown by the hand, driven by a bat or club or shot from weapons—baseball, cricket, golf, hockey and archery;[1] (3) sports in which falls or other miscellaneous accidents may occur—horse racing, polo, handball, basketball, and track and field events; (4) aquatic competition;[2] (5) sudden and unexpected natural deaths from existing acute, subacute or chronic disease precipitated by excitement, overexertion, exhaustion, or a combination of these factors.

In New York City in the 32-yr. period from 1918 to 1950, inclusive, fatal injuries were distributed in the various sports, as seen in the table.

SPORTS CHARACTERIZED BY BODY CONTACT

Football.—Most of the injuries in football were from direct violence in line play, in blocking and in tackling. Only on a few occasions was indirect force a factor, notably in cervical spine injuries. Other sources of direct and indirect trauma were kicks, falls, trampling, torsion and crushing force. In some cases, the manner of injury was unknown.

An acute, subacute or chronic focal infection followed by some form of generalized sepsis was a frequent cause of death in football injuries. Of ten such cases, the lower extremities were involved in five and the pelvic region in three, and there were two cases of head injuries. In this group, three instances of acute osteomyelitis were observed; one of the players developed a severe blood stream invasion and expired on the eighth day after the

Fatalities

Sport	Number of Cases	Necropsies
Football	22	12
Soccer	2	2
	21	21
	2	2
Baseball	43	27
Cricket	1	1
Golf	1	1
Basketball	7	4
Handball	3	2
Polo	1	0
Relay races	1	1
Total	104	73

From the Office of the Chief Medical Examiner.

[1] Deaths in hunting accidents and in other noncompetitive activities, such as bathing, boating and fishing were not considered; nor were the sudden and unexpected deaths, unless they were associated with injuries.

[2] Fatalities in hockey, aquatic competition, horse racing and archery were not observed.

injury. The primary focus demonstrated by operation was situated in the right iliac crest. In another case, a septicopyemia followed an acute osteomyelitis of the ankle, and the third developed a staphylococcic septicemia from an acute process in the right tibia. The clinical diagnoses in these cases were confirmed by operation and by necropsy.

In addition to the acute cases, there were four instances of chronic osteomyelitis that were attributed to football injuries. In one case, the necropsy revealed a low grade staphylococcic sepsis that followed a chronic suppurative and necrotizing lesion in the right iliac bone with extension to the soft parts of the iliac fossa, to the buttock and to the adjacent hip joint, where a suppurative arthritis was found. A second patient died of postoperative shock after a sequestrotomy for a chronic osteomyelitis of the femur, and a third expired of chronic sepsis also from a primary lesion in the femur. One instance of chronic osteomyelitis of the lumbar vertebras with suppurating osteoarthritis of the sacroiliac joint was encountered. This player was alleged to have received an injury to the lumbar region in a game 10 yr. prior to his death.

Both of the players in this group who had head traumas sustained injuries that resulted in infected hematomas of the scalp from which cellulitis and sepsis developed.

Intracranial injuries with hemorrhage and cerebral compression were observed on four occasions. There were three deaths from subdural hemorrhage without fracture,[3] two of which were of the acute variety in that compression symptoms developed shortly after the trauma. The other case presented the characteristics of a secondary or slow hemorrhage. The player was kicked in the head and complained of intermittent headaches but otherwise appeared in good condition. Two weeks later he began to exhibit signs of compression with headache, dizziness, occasional vomiting, hemiparesis, and stupor deepening into coma. A large subdural hemorrhage with the indications of increased cerebral pressure was found at the autopsy. In the remaining case of this series, there was a fracture of the skull with an epidural hemorrhage, which was sustained when the player ran into a wall on one side of the playing field.

Three deaths were the result of spinal injuries. There were two patients with fracture-dislocation, one involving the fourth and the other the fifth cervical segments of the spinal cord, with crushing injuries to the cord and complete motor and sensory paralysis below the level of the cord lesions, and the third had a fracture in the thoracic region, with a long-standing transverse myelitis and a urinary tract infection. The manner of injury in these cases was unknown. Such injuries are usually caused by indirect trauma from hyperextension of the neck or a twisting force applied to the head.

Intra-abdominal injuries were responsible for four deaths, and hemorrhage into the abdominal cavity was found at the necropsies on three occasions. One of these followed a rupture of the spleen from a blow on the abdomen, another presented several lacerations at the roots of the mesenteries of the small and large intestines with about 8 oz. (250 cc.) of free blood in the abdomen and an extensive retroperitoneal hematoma; the third patient had a rupture of the jejunum and the adjacent mesentery with intra-abdominal hemorrhage. The latter two were kicked in the abdomen. An acute suppurative peritonitis and septic pneumonia following a rupture of the ileum was responsible for the fourth death in this series and the patient received his injury in some unknown manner.

There was one instance of tetanus that followed a compound fracture of the right middle finger.

Injuries in soccer football were held responsible for two deaths; both players collapsed on the field. One of them had a fracture of the skull and an epidural hemorrhage and the other, alleged to have received an injury to the abdomen, showed no evidence of trauma. The necropsy established the cause of death as a luetic aortitis with stenosis of the ostia of the coronary arteries.

Boxing.—Injuries in boxing were usually the result of blows on the head or were sustained in a knockdown when the head of the boxer came in contact with the ring floor.

Of the 21 deaths in this sport, 15 were caused by subdural hemorrhage. Of these, 13 were attributed to ruptures of cortical cerebral blood vessels,[4] one to hemorrhage from a superficial cortical brain laceration, and another to a questionable injury of the posterior cerebral artery. Eight hemorrhages involved the left side and five the right, and two were bilateral. The amount of blood found in the subdural space varied from 2 to 8 oz. (60 to 250 cc.) or more. Ten of the 15 patients died within 40 hr., the period varying from one-half hour in one of the bilateral hemorrhage cases, to 38 hr. The other patient with bilateral hemorrhage survived for five and one-half hours. The remaining five patients expired after two days (in 2 cases), three days, one week and about two weeks, respectively. The latter boxer was knocked unconscious twice in a period of two weeks and apparently suffered no ill effects from the last episode. A few days later, he developed symptoms of cerebral compression and entered the hospital in an unconscious state with fixed dilated pupils, increased patellar reflexes, ankle clonus, equivocal Babinski sign, absent adbominal and cremasteric reflexes and a spasticity of the left arm. At the autopsy about 6 oz. (180 cc.) of dark red fluid blood was found under the left dura and there was marked flattening of the right cortical convolutions. Partly covering the inner surface of the dura on the left side was a brownish membrane that could be easily stripped off. Also on this side a cystlike cavity was found situated in the frontoparietal region. It measured 2½ by 4 in. (5.4 by 10.2 cm.), was covered by a delicate friable membrane and contained bloodstained fluid. The depressed base of the cyst in the frontoparietal lobes was covered by intact arachnoid membrane. In addition, the posterior border of the greater wing of the sphenoid on the left side, was rounded and thickened in comparison with the sharp-edged wing on the opposite side and the middle fossa of the skull on the left was wide and deep. A knoblike exostosis, remotely situated from the cyst and measuring ½ in. (1.3 cm.) in diameter, projected from the upper surface of the left petrous temporal bone.

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[3] Hey: Subdurales Hämatomals Sportverletzung, Deutsche Ztschr. ges. gerichtl. Med. 5: 12-16, 1925.

[4] Vance, B. M.: Ruptures of Surface Blood Vessels on Cerebral Hemispheres as Cause of Subdural Hemorrhage, Arch. Surg. 61: 992-1006 (Dec.) 1950.

The position of the cystlike cavity in the subdural space and the character of the covering membrane appear to exclude porencephaly. The possibility of an old localized and encysted subdural hemorrhage was considered.

Surface injuries were noted at the autopsies of eight patients. They varied from contusions and abrasions of the forehead, eyelids, nose, lips, cheeks and ears to a ½ in. (1.3 cm.) laceration on the chin in one boxer. The remaining seven patients did not show any of these lesions. The more pronounced lacerations that induce boxing officials to terminate bouts were not observed.

Some of the patients with subdural hemorrhage exhibited other brain lesions. There were a few scattered pinhead-sized hemorrhages in the white matter of the parietal lobe in one patient, a few petechial hemorrhages in the pontile peduncle in another, very slight localized effusions of blood under the cortical arachnoid membrane in two others, and a fifth patient presented a few small hemorrhages in the lenticular nucleus. For the concepts of the production and the remote effects of these hemorrhages, the reader is referred to Leary,[5] Cassassa[6] and Martland.[7] In addition to these lesions, several patients showed streaklike hemorrhages in the pons, which were considered due to pressure effects.[8]

Ruptures of the cortical "bridging veins" were responsible for most of the subdural hemorrhages in this series.[9] Tears of the cortical arterioles have also been described by various investigators,[10] and others have advanced the theory that these ruptures were the result of anteroposterior force and oscillation of the brain,[11] or in arteries, of a sudden release of pressure after flattening of the brain against the calvarium followed by arteriolar engorgement and rupture.[12]

Various grades of hypostatic pneumonia complicated some of the delayed deaths from subdural hemorrhage.

The lesions found in the other boxers varied considerably. One heavyweight fighter suddenly collapsed in a late round of a bout and died after three days. The necropsy disclosed pinhead-sized hemorrhages in the white matter of the basal ganglions, thrombosis of a small cortical vessel situated at the junction of the temporal and occipital lobes and a wedge-shaped area of softening under the thrombosed vessel, which was interpreted as an infarct. Microscopic examination confirmed the gross findings, and, in addition, some of the small blood vessels in the white matter adjacent to the infarct showed a perivascular round-cell infiltration, and a similar infiltration was found in the meninges. Another boxer, having been knocked down, his head striking the ring floor, showed small scattered hemorrhages in the optic thalamus, the cerebellum, and the region of the fourth ventricle. He survived four hours.

Injuries of the abdominal organs are uncommon in boxers. Only one case of suppurative peritonitis from a rupture of the small intestine was encountered. The victim died six days after receiving a blow on the abdomen. Similarly, with the exception of fractures of the ribs that occur occasionally, injuries to the chest organs are very rare. They were not observed in this study.

Occasionally, the autopsy fails to demonstrate evidences of trauma in boxers who die in the ring or shortly after a bout. Such was the case in two boxers, one of whom collapsed and died in the ring, and the only lesions found were cardiac dilatation and hypertrophy. The other boxer was admitted to the hospital in an unconscious state with indefinite symptoms of cerebral compression, and the autopsy likewise failed to disclose trauma. The death was attributed to cerebral concussion. A third death from status epilepticus was also observed, in which repeated beatings in the prize ring eight years prior to the onset of the convulsive seizures, was held to be the cause.

Wrestling.—Two deaths due to wrestling were noted, one from abdominal hemorrhage and a rupture of the spleen and the other from an acute lobar pneumonia complicating a fracture of the thoracic part of the spine. In both cases, the manner of injury was unknown. The first patient survived two days and 11 hr. and the second, 11 days.

DEATHS CAUSED BY MISSILES

Baseball.—Most of the injured in baseball were amateurs or semiprofessionals. Only one major league player was fatally injured when he was struck on the head by a pitched ball. In most instances, the injury was caused by a blow from a baseball that had been thrown, or driven by a bat. A few were injured in collisions between players, in falls or when sliding into a base. Head injuries predominated, notably fractures of the skull, of which there were 25 cases. Fourteen of these were accompanied by epidural hemorrhage and two of the 14 epidural cases were complicated by direct and contrecoup lacerations of the brain with subdural and subarachnoid hemorrhage. Four others of this group showed associated brain trauma in the form of slight to moderate contusions and lacerations that were thought to be of insufficient severity to influence the diagnosis of cerebral compression from epidural hemorrhage. The characteristic localized depression in the cerebral cortex under the epidural lesion was present in all of the 14 cases.

There were 11 cases in which diagnosis was subdural or intermeningeal hemorrhage associated with fractures; seven of these were confirmed by necropsy and one by operation. Included in this group was one case of fracture with bilateral tentorial tears, subdural hemorrhage and petechial hemorrhages in the brain substance. The player with the latter condition suffered an injury to the head by a baseball and succumbed one-half hour after the accident.

Two instances of subdural hemorrhage without fracture were observed. One of these players was struck on the head by a baseball four days before entering the hospital. On admission he was unconscious and had a dilated right pupil and indefinite neurological signs. The necropsy disclosed more than 8 oz. (250 cc.) of fluid and clotted blood in the right subdural space, with marked flattening of the left cortical convolutions. When the brain was incised, a small amount of clotted blood was evacuated from the left temporal lobe. This lesion was interpreted as a subcortical laceration. The other player was struck by a batted ball and sustained a subdural hemorrhage, presumably from a rupture of a cortical blood vessel.

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[5] Leary, T.: Subdural or Intradural Hemorrhages? Arch. Path. **28:** 808-820 (Dec.) 1939.

[6] Cassasa, C. S. B.: Multiple Traumatic Cerebral Hemorrhages, Proc. New York Path. Soc. **24:** 101-106 (May 8) 1924.

[7] Martland, H. S.: Punch Drunk, J. A. M. A. **91:** 1103-1107 (Oct. 13) 1928.

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[10] (*a*) Vance.[2] (*b*) Scott, M.: Spontaneous Nontraumatic Subdural Hematomas, J. A. M. A. **141:** 596-602 (Oct. 29) 1949.

[11] (*a*) Trotter, W.: Chronic Subdural Hæmorrhage of Traumatic Origin, and Its Relation to Pachymeningitis Hæmorrhagica Interna, Brit. J. Surg. **2:** 271-291 (Oct.) 1914. (*b*) Grant, F. C.: Chronic Subdural Hæmatoma, J. A. M. A. **105:** 845-849 (Sept. 14) 1935. (*c*) Munro, D.: Diagnosis and Treatment of Subdural Hematomata: Report of 62 Cases, New England J. Med. **210:** 1145-1160 (May 31) 1934.

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The death that occurred in a softball game was attributed to a subarachnoid hemorrhage and a fracture of the mandible. The player was injured when a bat that accidentally slipped from the hands of another player struck him on the side of the head. Aneurism of the cerebral vessels was not found.

An unusual case of traumatic hematoma of the head of the pancreas was disclosed at an autopsy. The injury was received in a collision with a player in an attempt to catch a fly ball. In addition to the hematoma, there was an extravasation of blood in the wall of the duodenum and an extensive fat necrosis. The patient entered the hospital in severe shock but survived seven days. The question of a coincidental spontaneous hemorrhage in the pancreas must be considered in such cases.

Infectious processes were responsible for 13 deaths in this game. There were six cases of osteomyelitis, five of which were acute and one chronic. The lower extremities were involved in all but one case. In the latter there were suppurative and necrotizing foci in the bodies of the ninth and 10th thoracic vertebras which followed an injury to this region by a baseball. The necropsy disclosed, besides the local lesions, thrombosis of the surrounding veins and septic infarcts of the lungs complicated by an empyema. In one of the acute cases there was a long-standing chronic osteomyelitis of the left femur, which was apparently quiescent. After an injury to the left knee by a batted ball, an acute process developed at the site of the old disease.

Acute suppurative peritonitis was the cause of death in three cases. In two of these, exploratory laparotomies revealed ruptures of the ileum. One of the players was struck on the abdomen with a bat and the other was accidentally kicked in the same region. The third player, struck by a batted ball, suffered no ill effects for five days, after which he complained of abdominal pain, with vomiting and constipation followed by meteorism and singultus. At the autopsy, a suppurative peritonitis and a perforation of the jejunum surrounded by a contused area were found. This lesion was interpreted as an original contusion, which became devitalized in the intervening five-day period and finally ruptured.

Three cases of generalized blood stream infection were attributed to baseball injuries. One was septicemia, due to a hemolytic Streptococcus following an injury to the thumb, another a staphylococcic sepsis from an infected finger and a third, a laceration of the scalp complicated by a cellulitis and a blood-stream invasion. In one instance of sudden death from a massive pulmonary embolism, thrombosis of the femoral vein and a fracture of the femur were observed, and, in another patient, a player who was struck on the chest by a batted ball and who immediately collapsed and died on the playing field, a dilated and hypertrophied heart was the only lesion found at the necropsy.

Two other deaths followed injuries by missiles. One occurred when a cricket player was struck in the abdomen by a cricket ball driven by a bat and sustained a rupture of the small intestine with acute peritonitis and the other, a caddy, died of a fractured skull and intracranial injuries when a golf ball struck him on the head.

Basketball.—Seven deaths occurred in basketball. Most of them were due to infections from relatively trivial injuries, such as a staphylococcic septicemia from an infected contusion of the thigh, a septicemia and an osteomyelitis of the femur, a similar condition with the primary lesion in the tibia, a sepsis and suppurative pericarditis following a contusion of the hip, and a post-traumatic anemia from persistent nasal hemorrhage with infection and ulceration of the nasal mucosa, which followed mild trauma to the face.

Of the two remaining patients in this category, one died of subdural hemorrhage following head trauma and the other expired from an alleged post-traumatic epilepsy supposedly due to a head injury a year prior to the fatal outcome.

Handball.—There were three deaths in this sport. Two were caused by fractures of the skull and epidural hemorrhage, one of which was subjected to necropsy and the other to operation. The third patient died of an acute leptomeningitis following a laceration of the brain without fracture. In the latter case, according to the history, the injury was sustained when a handball struck the player on the head.

A fracture of the cervical part of the spine was the cause of death of a polo player who fell from his horse, and a relay runner expired from an acute suppurative peritonitis, the consequence of a rupture of the large intestine, when he ran into railing along the side of the track.

COMMENT

The literature of the past 30 yr. contains a fair number of references to nonfatal injuries in the various branches of athletics, but fatal trauma has received scant attention, with the notable exception of the deaths in boxing. Most of the contributions in the other sports refer to isolated instances of deaths in which the circumstances are purely accidental, whereas in boxing the suspicion of a willful attempt to seriously injure an opponent may instigate a judicial inquiry, hence the medicolegal implications of such deaths have stimulated more thorough medical investigations.

A number of investigators have contributed to the study of nonfatal and fatal injuries in boxing,[13] and some of them have also considered the mechanisms of the "knockout" and their relation to the sudden deaths in the sport. Wolff,[13a] in a general review of boxing injuries, collected histories of 12 fatalities of which six were caused by subdural hemorrhage, two by fractures of the skull and one each by shock, brain hemorrhage, rupture of the intestine, and edema of the glottis. The latter death, reported by von Sury,[14] followed a blow on the side of the neck, which caused hemorrhage in the laryngneal region, glottic and pulmonary edema, and death shortly after the injury was received. Lami,[13c] Jankovich,[13b] and Wolff [13a] paid particular attention to the phenomena of "knockouts" and to the causes of sudden death in boxing, while other observers discussed the lesions found at the necropsies on boxers' deaths.[13d,e]

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[13] (*a*) Wolff, K.: Boxsport und Boxverltezungen, Deutsche Ztschr. Chir. **208**: 379-408, 1928. (*b*) Jankovich, L.: Suites mortelles d'un combat de boxe, Ann. méd. lég. **15**: 795-799 (Oct.) 1935. (*c*) Lami, G.: Knockout e morte improuvisa nella boxe, Riforma med. **50**: 191-192 (Feb. 3) 1934. (*d*) Popielski, B.: Fatal Injuries in Boxing, Polska gaz. lek. **13**: 293-295 (April 15) 1934. (*e*) Grasso-Biondi, I.: Contributo alla conoscenza delle lesioni mortali da pugilato e dell'assurdo nella ricerca della concausa, Rassegna previd. sociale **26**: 33-60 (July-Aug.) 1939. (*f*) Tyrell, P.: Shocktod beim Boxkampf, Deutsche Ztschr. ges. gerichtl. Med. **19**: 415-421, 1932. (*g*) von Marenholtz: Tod in Boxkampf, Med. Welt. **6**: 556-557 (April 16) 1932.

It is generally conceded that the three kinds of trauma most likely to cause unconsciousness are blows on the chin, injury to the abdomen, and trauma to the carotid sinus. Most observers believe that sudden force applied to the chin causes cerebral concussion, reflex action on the labyrinth, and a Ménièrelike syndrome; an injury to the abdomen affects the vagus terminals and causes vasodilatation in the splanchnic area, interference with heart action and pulmonary circulation, and dyspnea. The sequence of events of trauma to the carotid sinus that was experimentally demonstrated by Hering,[15] in 1927, is regarded as a reflex ventricular fibrillation, dilatation of the blood vessels about the sinus, and a cerebral anemia. The relation of these phenomena to unexplained sudden deaths in boxers with negative necropsy findings is accepted by most investigators.

The late neurological manifestations in retired pugilists, first described by Martland [7] under the title of "Punch Drunk" and supposedly caused by repeated traumas to the head during their ring careers, stimulated the interest of a number of investigators who studied the various mental and neurological disturbances in these cases.[16] For further information on the subject, the reader is referred to their contributions.

Among those who have contributed to the subject of nonfatal injuries in football were Hanson and Hauser [17] and McPhee,[18] in their studies of the lesions among college players, and Burnett [19] and Horan,[20] who considered them among high school students. No serious craniocerebral, intra-abdominal or chest injuries were observed by these authors. Most of the injuries involved the extremities in the form of sprains, muscle and tendon ruptures, fractures, and dislocations. McPhee collected information on 889 injuries in 563 cases over a period of 10 yr. and found four fractures of the transverse processes of the lumbar vertebras, with three uneventful recoveries. In the remaining case troublesome eye symptoms developed, whose relation to the injury was questionable. The most serious injuries found in these studies were a backward dislocation of the leg at the knee with avulsion of the soft tissues and a subsequent thrombosis that necessitated amputation, two fractures of the spine, and injury to the kidney followed by hematuria. All the victims apparently recovered. Other contributors to studies of nonfatal injuries in this game were Tillman [21] and Blondal [22] and case reports of fatal traumas were published by Séjournet,[23] Frank,[24] Lande and his associates,[25] and others.

In other sports, no recorded death was found in the literature of the past 10 yr. with the exception of a case reported by Guimbellot and his co-authors [26] who reviewed the clinical observations and the autopsy findings in a case of fatal fracture of the cervical part of the spine with injury to the cord, incurred in a wrestling match. Most of the injuries were mild in nature and were troublesome mainly from the standpoint of time loss in participation in the sport.[27] On a few occasions, severe injuries with lasting effects compelled the cessation of all athletic activities.

CONCLUSIONS

It is evident that the method of play in games and the kind of athletic activity in the other competitions exerts an influence on the type of injury most likely to occur in a particular sport. Thus, subdural hemorrhage is frequent in boxing, whereas fractures of the skull and intracranial injuries predominate in baseball. Deaths from the immediate effects of trauma, such as hemorrhage and shock, and from infection were about equal in football, and infections appeared to prevail in basketball. Many of these infections followed relatively trivial injuries that would have possessed little significance had infection not set in. Since the introduction of the sulfonamides and the antibiotics, a marked reduction in the incidence of these infections has been apparent; so today they are rarely seen at the necropsies on fatal cases. Incidentally, the efforts to reduce the incidence of nonfatal accidents in the various branches of athletics by revision of the rules, by better medical supervision and coaching, and by the introduction of protective equipment have met with some measure of success.

In recent years, opponents of boxing have expressed the opinion that the sport should be abolished, that it is potentially dangerous and not necessary to the development of those attributes which are most desirable in young men. Thirty-two years of boxing competitions, however, have produced fewer deaths, in proportion to the number of participants, than occur in baseball or football and far fewer deaths than result from daily accidents. It seems that the moral and physical benefits derived from boxing far outweigh the dangers inherent in it or any of the other competitive sports.

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CLINICAL NOTES

ASCITES DUE TO MYXEDEMA

REPORT OF A CASE

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Of the many causes of recurring ascites in patients who do not have evidence of the more common causative factors, such as cardiac, renal, or hepatic disease, myxedema is rarely considered and rarely encountered. Because of the comparative rarity of this condition the following case is reported.

REPORT OF CASE

A 45-yr.-old woman was first seen at the clinic on Nov. 1, 1949, with the chief complaints of swelling of the abdomen, weight loss, and weakness of 10 weeks' duration. She had had a thyroidectomy in 1940 for hyperthyroidism; this operation was followed by myxedema. At that time she was advised to take 1½ grains (0.10 gm.) of thyroid daily for the rest of her life. She had taken this dosage until about nine months before her present admission when an examination by her local physician revealed a basal metabolic rate of — 3. The thyroid medication was decreased to one or two ½-grain (30 mg.) tablets weekly. She had remained in fairly good health until 10 weeks before coming to the clinic, at which time total hysterectomy and bilateral salpingo-oophorectomy were performed because of a long period of menorrhagia. At the time of operation there was no evidence of malignant disease in the pelvis. About one week after the operation she noted swelling of the abdomen and considerable weakness. The abdominal swelling had increased to such an extent that it necessitated two abdominal taps in the 10-week interval; each yielded about 8 l. of yellow fluid. There was no history of abdominal pain, nausea or vomiting, and she stated that her appetite was excellent. After operation she had had three or four bowel movements daily.

The patient was admitted to the hospital on Nov. 3, 1949, for further study and observation. Physical examination on admission revealed that she was pale, the hair was coarse and dry, the skin was dry with loss of turgor, the eyebrows were sparse, and she had ascites. The heart and lungs were normal and the blood pressure was 152 mm. systolic and 100 mm. diastolic. There were no palpable lymph nodes and no palpable organs or masses in the abdomen.

Laboratory studies demonstrated a hemoglobin content of 13.5 gm., a leukocyte count of 6,700, and a normal differential count. The nonprotein nitrogen was 31 mg. per 100 cc., serum chloride 99 mEq., serum bilirubin 0.2 mg. per 100 cc., blood cholesterol 142 mg. per 100 cc., and a total serum protein of 4.9 gm., with an albumin level of 2.9 gm. and globulin level of 2 gm. Liver function tests otherwise were within normal limits. Test of the stools with guaiac gave negative results. The specific gravity of the urine was 1.018, and there was a trace of albumin; microscopic examination of the urine gave negative results. Roentgenograms of the gastrointestinal tract made after paracentesis demonstrated some forward displacement of the stomach in the region of the antrum. A roentgenogram of the chest revealed elevation of both diaphragms.

Abdominal paracentesis was performed and more than 11 l. of murky yellowish fluid having the characteristics of a transudate was obtained. Some of this fluid was injected into a guinea pig and some was centrifuged; sections made of the sediment were negative for tumor cells, as was the guinea pig injection. After the abdominal tap, examination of the abdomen revealed no palpable organs or masses.

The question then arose as to whether or not the ascites was the result of myxedema. Since the ascites had begun one week after the pelvic operation, and the patient had been taking one or two ½-grain (30 mg.) tablets of thyroid per week until two weeks before entry and was gaining 2 lb. (0.75 kg.) in weight per day, surgical exploration of the abdomen was decided upon.

Operation was performed on Nov. 17, 1949. No definite cause of ascites was found. The portal pressure was recorded as 90 mm. of water. Biopsy specimens of the liver, head of the pancreas, and enlarged nodes of the small bowel were reported as negative. The peritoneum was somewhat reddened and inflamed, but no definite evidence of tuberculosis could be seen. Specimens of the abdominal fluid were taken for smear, culture, and guinea pig injection, all of which subsequently proved negative for acid-fast organisms. With the clinical evidence of myxedema and the negative exploratory operation it was thought that the ascites was most likely the result of the poorly treated myxedema, and administration of thyroid, 2 grains (0.12 gm.) daily, was begun. In addition, the patient was given intravenous injections of 25 gm. of serum albumin daily, which raised the total protein to 6.5 gm., with an albumin content of 4.5 gm. and a globulin content of 2 gm. The ascites rapidly subsided, and her mental and physical appearance improved noticeably. She was discharged from the hospital on the 16th postoperative day with instructions to continue the daily dosage of 2 grains (0.12 gm.) of thyroid for two months and then to have a recheck examination and further evaluation of her dosage requirements. In a letter dated May 13, 1950, the patient stated that she had been taking thyroid as instructed and had not returned for check-up examination because she "had not felt so well in the past 15 years and did not want to be reminded of doctors." There had been no recurrence of ascites during this interval.

COMMENT

Ascites occurring as a direct result of myxedema has only occasionally been mentioned in medical literature. The earliest reference to its occurrence appears to be that of Kocher,[1] who, in 1883, reported two cases after total thyroidectomy. Faber,[2] in 1919, also reported the occurrence of myxedema after thyroidectomy in one case. Most of the references to the subject appear in the older literature, although one of the recent standard works on the subject noted its occurrence.[3]

The mechanism of production of ascites in these cases is not known, but it apparently involves all the serous surfaces, as cases have been reported associated with pericardial and pleural effusions either alone or in conjunction with fluid collections elsewhere in the body.[4] The problem of fluid in the various serous cavities raises two questions: 1. Has the myxedema caused myxedema heart disease and, as a result, congestive failure with ascites the symptom? 2. Is ascites caused directly by myxedema in the same manner as is subcutaneous edema, which is seen in this disease?[4,5]

It is doubtful that congestive failure is part of the picture of true myxedema heart. In Zondek's original de-

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[1] Kocher, T.: Ueber Kropfexstirpation und ihre Folgen, Arch. f. klin. Chir. 29:254-337 (Oct.) 1883.

[2] Faber, K.: Kakexia strumipriva med sterk ascites som hovedsymptom, Ugesk. f. læger. 81:1403, 1919.

[3] Means, J. H.: The Thyroid and Its Diseases, ed. 2, Philadelphia, J. B. Lippincott Company, 1948, chap. 9, pp. 211-212.

scription of myxedema heart, there was no definite evidence of congestive failure, and no mention was made of fluid in the abdominal or pleural cavities [5] in the seven cases he reported. This also appears to have been true in several cases reported by others, including Faber,[2] Mussio Fournier,[4a] Marsh, [4b] Evans,[4d] and Hatlehol.[6]

Willius and Haines,[7] in a study of 162 cases of myxedema heart, found only one patient with signs of definite congestive failure, and this patient had advanced cardiovascular renal disease. In Christian's series of 32 cases none showed evidence of congestive failure or ascites.[8] Fahr,[9] on the other hand, reported that 75% of his patients with myxedema showed some manifestations of heart failure and 30% of all his patients with myxedema had shown very severe symptoms and signs of heart failure that were promptly relieved by administration of thyroid. In support of his view he referred to the experimental work of Goldberg,[10] who removed the thyroids of sheep and goats immediately after birth and examined these cretin animals at necropsy one to two years later. Pronounced arteriosclerosis was found, in addition to generalized anasarca and stasis of liver, kidneys, and lungs. In nearly all the animals the heart was described as dilated, flabby, and pale. Hanssen,[4g] however, believed that the pronounced arteriosclerosis present in these cases after removal of the thyroid was the cause of cardiac insufficiency. He thought that the experimental observations were in accord with clinical experience that myxedema causes early and widespread arteriosclerosis that does not diminish after thyroid therapy. This was also the opinion of Christian,[11] who stated that "the myocardial disturbances caused by thyroid deficiency and cured by thyroid feeding are relatively rare, while arteriosclerosis and coronary disease coincident with thyroid deficiency are much more common."

Mussio Fournier [4a] stated that the action of thyroid extract on dropsy syndromes developing independently of thyroid insufficiency was undeniable but inconstant and that it rapidly lost its power; but, when thyroid extract was administered to a patient with a dropsy syndrome that had developed on a myxedematous basis, the action of the drug was constant and lasting. This appears to be borne out in the cases reported by Hanssen, in which ascites recurred and disappeared as thyroid was stopped or administered. When thyroid was given continuously, ascites permanently disappeared. This also appears to be true in the case here reported, as ascites did not recur after thyroid in proper dosage was begun until the patient herself decreased this dosage some seven months before she came to the clinic. It must be concluded that the true thyroid heart is a rare phenomenon and that, when present, it is rarely associated with congestive failure.

The cardiac output in cases of myxedema heart has been studied and found to be diminished [12] but without increase in the venous pressure.[13] In the case reported by Evans [4d] a series of venous pressures was determined for over a month; the pressures remained at a constant level in spite of administration of digitalis. Blumgart [14] also described normal venous pressures in seven myxedematous patients in whom there were no signs of congestive failure. Capillary filtration may be decreased [15] and the capillaries constricted.[16] The osmotic pressure of the blood [17] and the albumin content of the blood serum [18] tend to be increased. Careful observations of the type of ascitic fluid found in myxedematous ascites show nothing to distinguish it from ascites resulting from other causes.[19] A high protein content was reported in one case but not in the cases reported by others, including Faber [2] and Hanssen.[4g] It has been shown that a high protein level, as was found in this case, is not unusual in fluid of this density, namely 1.020.[20] The amount of ascitic fluid that may be found in these cases is sometimes surprising. In Hanssen's case,[4g] over an eight-year period before the diagnosis was finally established, the patient had a total of 157 paracenteses, yielding 1,357 l. of ascitic fluid, and in a case recently reported by Paddock [20] a single abdominal tap yielding 8 gal. (30 l.) of ascitic fluid.

SUMMARY

A case of ascites resulting from myxedema has been presented. It is of interest that the ascites followed a pelvic operation by one week. With the administration of thyroid, the patient has shown improvement, clinically, and the ascites has not recurred over a period of six months.

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HELIO-THERM, MODEL F, ACCEPTED

Manufacturer: Ultrad Laboratories, 208 Maplewood St., Watertown 72, Mass.

The Helio-Therm, Model F, is a generator of radiations including the near ultraviolet, the visible and the near infrared wavelengths. The radiation comes from an incandescent tungsten filament 300-watt lamp. The lamp (bulb) operates at a voltage higher than its rated voltage. The tungsten is "superheated" by electric current passing through the filament, giving a temperature which is stated by the firm to be approximately 3,200° Kelvin. The inside of the lamp is partly coated with aluminum to make a reflector and the emerging beam is passed through 5 cm. (2 in.) of glycerin. This filtration is intended to remove the longer infrared wavelengths. Because of the "superheating" the life of the lamp is shortened to an average of about 25 hours, according to the manufacturer. The incandescent tungsten lamp burning at a higher voltage produces an increased amount of radiation throughout the whole spectrum.

The Helio-Therm, Model F, is a floor lamp standing on a four-legged castered base. A horizontal arm, which can be raised or lowered, bears the generator. The latter is shaped like a large automobile headlight, and can be aimed in various directions. Unpacked, the device measures 162 by 65 by 72 cm. (65 by 26 by 29 in.) and weighs 13.1 kg. (29 lb.). Crated for shipment it measures 60 by 45 by 60 cm. (24 by 18 by 18 in.) and weighs 18 kg. (40 lb.). The foreign shipping weight is 40 kg. These shipping weights include the chrome tube stand (5 ft. in length, separately packed) and an extra bulb. The device will operate on either direct current or alternating current of any usual frequency, and it draws 300 watts.

In a laboratory acceptable to the Council, the spectral distribution of the energy from the lamp was examined both with and without the glycerin filter by means of a quartz spectrometer. It was found that the band spectrum extends from about 3,100 angstroms to about 14,000 angstroms without the glycerin filter and to about 11,000 with the glycerin filter.

The manufacturer submitted data showing that of the total radiant energy emitted by the Helio-Therm, Model F, in the spectrum bounded by 3,100 angstroms on the ultraviolet side and 14,000 angstroms on the infrared, approximately 2% of the total energy is in the near ultraviolet zone (3,100 to 3,900 angstroms), roughly 37% is in the visible zone (3,900 to 7,600 angstroms) and 61% in the near infrared zone (7,600 to 14,000 angstroms) which has been filtered out by the glycerin cell. The total intensity at 2 in. treatment distance is 3.2 gram calories per square centimeter per minute, or approximately three times the intensity of sunlight.

Exploratory measurements of the radiation energies were made for given distances, from which it appears that for short distances (5 cm. to 15 cm.) the radiation intensity per square centimeter from the Helio-Therm, Model F, is at least equal to that of sunlight measured under similar conditions.

While the apparatus is acceptable as a source of radiant heat for local application, the Council was not convinced that this "superheated" tungsten lamp is more efficacious therapeutically than a similar high powered (500 or 1000 watt) tungsten filament incandescent lamp operating at rated voltage, with a filter, at a treatment distance, namely, that distance between the lamp and the patient at which one approaches the threshold of pain due to excess temperature rise in the skin and blood stream.

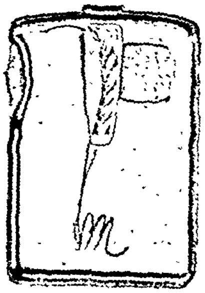
Although, in the opinion of the Council on Physical Medicine and Rehabilitation the firm has not produced critical evidence that the radiation from a "superheated" tungsten filament lamp has superior therapeutic qualities, the Council voted to include the Helio-Therm, Model F, in its list of accepted devices as a local applicator of radiant heat.

MICROTONE HEARING AID, MODEL T-10, ACCEPTED

Manufacturer: The Microtone Company, Ford Parkway on the Mississippi, St. Paul 1.

The Microtone Hearing Aid, Model T-10, is a hearing aid of conventional design, one distinctive feature being the absence of a tone-control. The wheel-type control is for Off, On, and Gain. Excluding the latch on top and the clothing clip on the front it measures 63 by 44 by 21 mm. The transmitter alone weighs 70 gm. With the batteries it weighs 101 gm., and the receiver and cord add 12 gm.

From acceptable sources the Council obtained evidence that the instrument was of good construction, performed as represented by the manufacturer, and satisfied the published minimum requirements of the Council for acceptable hearing aids. The Council on Physical Medicine and Rehabilitation voted to include the Microtone Hearing Aid, Model T-10, in its list of accepted devices.

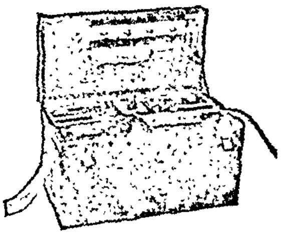


Microtone Hearing Aid, Model T-10

EDIN ELECTROCARDIOGRAPH, MODEL 220, ACCEPTED

Manufacturer: Edin Company, Inc., 207 Main St., Worcester 8, Mass.

The Edin Electrocardiograph, Model 220, is a direct writing instrument. The acceptance of a previous Model 210T, which likewise produces pen-and-ink records on permanent graph paper and has the same power consumption, was announced in The Journal of May 14, 1949. The present Model 220 weighs 13 kg. (29¾ lb.) and measures 25 by 21 by 43 cm. (10 by 8⅜ by 17 in.). When packed for domestic shipment it weighs 16 kg. (35 lb.) and measures 34 by 38 by 49 cm. (13½ by 11¼ by 19½ in.). The foreign shipping weight is 27 kg. (60 lb.). Included in these shipping weights are accessories.



Edin Electrocardiograph, Model 220

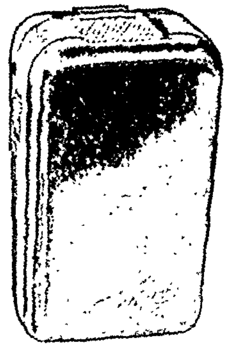
Evidence that the apparatus was sound in construction and satisfactory for its purpose was obtained from laboratories and clinics acceptable to the Council. The Council on Physical Medicine and Rehabilitation voted to include the Edin Electrocardiograph, Model 220, in its list of accepted devices.

MAICO HEARING AID, MODEL J, ACCEPTED

Manufacturer: The Maico Company, Inc., 21 North Third St., Minneapolis 1.

The Maico "Top Secret" Hearing Aid, Model J, is an electric hearing aid of conventional form except for the position of the microphone, which is mounted on the top of the case facing upward. The microphone grill is deeply recessed. This is intended to reduce clothing noise. The case measures 74 by 45 (greatest thickness) by 28 mm., and is somewhat wedge-shaped. The weight is 92 gm. without batteries and 123 gm. with batteries. Both magnetic and crystal receivers are available.

The Council obtained evidence from acceptable sources that the workmanship and performance were good and that the instrument satisfied the published minimum requirements of the Council for acceptance of hearing aids. The Council on Physical Medicine and Rehabilitation voted to include the Maico "Top Secret" Hearing Aid, Model J, in its list of accepted devices.



Maico Hearing Aid, Model J

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INCIDENCE OF PULMONARY CARCINOMA

Numerous surveys have indicated that the incidence of carcinoma of the lung has been increasing in recent years. There is no general agreement, however, as to whether this increase is real and absolute or merely apparent and relative, owing to such factors as better diagnosis, increasing clinical awareness of the condition, and the increase in life expectancy.

A recent report on the incidence of pulmonary carcinoma in 36,864 autopsies performed during the period 1918-1946 at the Los Angeles County Hospital shows that in the area served by this hospital the increase of the disease was real, absolute, and disproportionately greater than the increase in cancer in general.[1] In the 36,864 necropsies, a total of 6,023 malignant tumors were found which with few exceptions were the cause of death. Of these tumors, 508 were carcinomas of the lung, an incidence of 1.4% in all necropsies and 8.4% of all malignant neoplasms. During the period 1918-1922, cancer was reported in 11.2% of all autopsies, while during the period 1943-1946 it was reported in 20.7% of all autopsies. Carcinoma of the lung showed an even greater increase than cancer as a whole. No cases were reported during the period 1918-1922, but in succeeding years the incidence rose progressively. Thus, during the period 1923-1927, carcinoma of the lung was found in 0.6% of all autopsies and constituted 4.3% of all tumors found, while in 1943-1946 corresponding figures were 2.3% and 11.3%. When the incidence of lung carcinoma in consecutive groups of 500 malignant tumors was analyzed, a gradually increasing trend was apparent, with 10 lung cancers in the first 500 and 66 in the last. Again, when necropsies were divided into groups of 1,000, a gradual increase in lung carcinoma was apparent throughout the 32 years, with an acceleration in the period 1939-1943. Furthermore, the necropsy rate for lung carcinoma in relation to hospital admissions increased more than twice as much as did that for all cancers combined. In contrast with the findings in carcinoma of the lung, comparable increases were not found for carcinoma of the stomach, large intestine, or pancreas, or for intracranial tumors.

There was little change in the proportion of males in the necropsy population; hence it was concluded that the increase of lung carcinoma was not explicable on the basis of a shift in sex ratio. There was a gradual increase in the average age; however, if the increase of carcinoma of the lung were due solely to aging of the population, one would expect even greater increases in cancer of the large intestine and pancreas since the peak incidence of these diseases is at a later age than that of carcinoma of the lung.

Evidence was also presented to show that the increased incidence of lung carcinoma could not be attributed to improve recognition by the pathologist, to a rising necropsy-permit rate, or to a greater interest in obtaining permits in cases clinically diagnosed. Furthermore, there was no evidence indicating either a large-scale selective referral to the hospital of lung cancer cases or of selective immigration of persons having pulmonic diseases into Los Angeles County, while no known occupational hazards for lung cancer were unduly represented in the hospital population.

This apparently real increase in carcinoma of the lung in the Los Angeles hospital is in contrast to the very slight increase reported by Steiner in 5,515 necropsies performed between 1902 and 1941 at the University of Chicago.[2] It was felt that the findings represented a real difference in the two materials and possibly in the two communities, thus suggesting a condition existing in the entire population of the county. It was felt that the smog condition was of too recent occurrence to account for the increase, unless previous data on the latent period for induction of lung cancer are inapplicable. In concluding their report, the authors emphasize that, regardless of whether the incidence of lung carcinoma is increasing or has increased at all, its present level is so high that it constitutes a major public health problem requiring appropriate clinical, experimental, and statistical studies.

BACILLARY DYSENTERY

Bacillary dysentery is a disease that has been widely distributed throughout the world from time immemorial. It was known to the ancients, as shown in Hippocrates' "Epidemeion." Until the discovery of the specific causative agent by Shiga in 1898 and Flexner in 1900, very little advance was made in our knowledge of the disease. The greatest progress has been made during the last two decades, particularly in the fields of pathology and bacteriology. For example, patients may have lesions of the intestine at sigmoidoscopy with little or no clinical symptoms and signs. Yet these patients are just as infective as those who are sick. No longer is pathogenicity determined by the particular strain present, of which there are at least 19 different types. The Sonne-Duval bacillus, once regarded as causing a rather benign dysentery in children, may be as virulent as the time-honored Shiga-Kruse infection. Any dysentery strain may play havoc in a population hitherto free of the disease, and in endemic areas susceptibility appears to return about every 20 years.

The disease has been traced from the acute to the chronic phase in the same human being, so that the chronic type is now better understood. While the etiology of chronic distal ileitis or chronic ulcerative colitis is still controversial, there appears to be no doubt that cases have followed acute bacillary dysentery. In the Jersey City epidemic of Flexner dysentery in 1934, chronic distal ileitis or chronic ulcerative colitis developed in 10.7%. Whether all cases follow bacillary dysentery cannot be proved, since many of the patients are seen for the first time one or more years after onset, when the dysentery organisms are no longer present and the original acute attack has been forgotten.

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[1] Steiner, P. E.; Butt, E. M., and Edmondson, H. A.: Pulmonary Carcinoma Revealed at Necropsy, with Reference to Increasing Incidence in the Los Angeles County Hospital, J. Nat. Cancer Inst. **11**: 497, 1950.

[2] Steiner, P. E.: Incidence of Primary Carcinoma of the Lung with Special Reference to Its Increase, Arch. Path. **37**: 185, 1944

Bacillary dysentery continues to be a great "war disease"; it is transmitted by food, fingers, and flies and remains a serious hazard for civilians despite the sulfonamides and antibiotics.

THE CONTROL OF MALARIA

Within the lifetime of many physicians now in practice a tremendous change in the incidence of and mortality from malaria has occurred, not only in the United States but also in many other countries. Both the cause of the disease, first described by Laveran, the French Army surgeon in 1880, and its insect vectors, the Anopheles group of mosquitoes, incriminated by Ronald Ross and the Italian malariologists 10 years later, have been known for well over 50 years. With these discoveries as a basis for preventive action, it was obvious that this must take the form of eradication of the vector or sterilization of the blood of human carriers, but preferably both.

As Faust[1] has shown, there is no reasonable doubt that Anopheles mosquitoes existed in America long before the Columbian Era and that the Plasmodium was introduced by infected Europeans and African slaves. The spread of the disease from original foci in the eastern United States was mainly the result of the migrations of the pioneers, and it was known by 1850 to exist from New England and the southeastern states to California and the Columbia River Valley. In certain areas—northernmost New England, the Allegheny highlands, the Rocky Mountains, the Great Inland Desert, and the Western Sierras—it was not known to occur. Naturally it flourished best in this country in the southern states, where the Anopheles was able to breed for eight to 10 months of the year, as contrasted with the three or four warm summer months of the northern area.

A complicating factor in the distribution and survival of the disease was war, for in the conflict in the states in 1861-1865, northern soldiers returning from service in the southern states carried the infection; in the Spanish-American War many soldiers serving in Cuba and the Philippines were infected; and in World War II many northern troops were trained in the South and much of the fighting occurred in districts in the Pacific more or less heavily infected with malaria. Returning soldiers were frequently carriers, despite the prophylactic and curative use of antimalarial drugs.

The control of malaria is a good example of the fact that such problems are not merely medical but also economic. The eradication of Anopheles mosquitoes requires large sums of money not only for drainage projects but also for the purchase and proper distribution of insecticides and larvicides. This is an annual performance and needs trained personnel for adequate accomplishment. In periods of financial depression there is diminished expenditure for mosquito control and inability of the poorer segments of the population to procure properly balanced diets, with resulting lessened resistance to infection. Economic factors were doubtless responsible for the fact that widespread attempts to control malaria were not made until many years after the knowledge necessary to formulate prophylactic measures was available.

Before the war in Korea, the disease was largely under control, but one must not overlook the fact that many malaria-carrying soldiers will return from this area and that there must be constant watchfulness to see that this does not result in a flare-up in the incidence of the disease.

BCG VACCINATION

BCG vaccination has been used for more than a quarter of a century. Its true role in the prevention of tuberculosis still remains a subject of controversy. A status report has been published in THE JOURNAL[1] by the Council on Pharmacy and Chemistry. Though it is impossible to conduct ideal experimental BCG studies in man, such studies can provide evidence approaching that sought in animal experimentation. Such evidence is reported by Dahlström and Difs,[2] who investigated the incidence of various types of tuberculous disease among tuberculin-negative Swedish Army conscripts, whom they divided into two comparable groups, one of which was vaccinated with BCG. The results indicate that the incidence of not only primary tuberculosis but also exudative tuberculous pleurisy and early postprimary destructive pulmonary tuberculosis was significantly reduced in the vaccinated (36,235) compared with the nonvaccinated (25,239) soldiers. This is the first time it has been shown that the postprimary tuberculous diseases may be prevented by BCG vaccination. The number of deaths from tuberculosis was also significantly reduced. Since the vast majority of soldiers were infected while in military service, the Swedish investigators conclude that it "is therefore important to carry out vaccination, so far as possible, in such good time that protection will have developed before the conscript enters military service."

BCG vaccination seems to be gaining favor in some quarters for the prophylaxis of tuberculosis, but the disease should not be regarded as being in the class of typhoid; so far as control is concerned, much remains to be done. Other careful studies of tuberculosis prophylaxis with BCG vaccination should be instituted with the ever essential tuberculin testing and sane interpretation.

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[1] Faust, E. C.: History of Malaria in the United States, Am. Scientist 39: 121, 1951.

[1] The Status of BCG Vaccine, Report of the Council on Pharmacy and Chemistry, J. A. M. A. 144: 1260-1261 (Dec. 9) 1950.

[2] Dahlström, G., and Difs, H.: The Efficacy of BCG Vaccination: A Study on Vaccinated and Tuberculin Negative Non-Vaccinated Conscripts, Acta tuberc. Scandinav. 25 (Supp. 27): 1-133, 1951.

MEDICAL NEWS

COLORADO

Annual Cancer Seminar.—This seminar will be held at the Broadmoor Hotel, Colorado Springs, Sept. 8, under the sponsorship of the Penrose Cancer Hospital and the College of American Pathologists. Dr. Arthur P. Stout, professor of pathology at Columbia University, New York, and Dr. Philip J. Hodes, professor of radiology at the University of Pennsylvania, Philadelphia, will jointly conduct the seminar. Dr. Leo H. Garland, clinical professor of radiology, Stanford University School of Medicine, San Francisco, will speak at the banquet. Fifteen problem cases of thoracic lesions having some relation to the field of tumors have been chosen. A photographic reproduction of the roentgenograms and a clinical summary of each case will be submitted to the participating radiologists, who will be invited to submit their diagnoses on an unsigned card, for purposes of tabulation. A set of slides of the same cases, with the same clinical summaries, will be submitted to the participating pathologists. All those interested may attend. There will be no registration fee; hotel reservations should be requested in advance. The meeting will be called at 9 a. m.

CONNECTICUT

Health Exhibits at County Fairs.—The Connecticut State Medical Society's committee on rural medical service will sponsor a health exhibit for display at a number of Connecticut's fairs in August and September. The project was inaugurated last year when a three-panel exhibit presented information on physician distribution in rural areas and voluntary health insurance. Success of that project has encouraged its continuance. This year's exhibit will feature a display of health pamphlets for distribution to fair patrons. Members of the committee are Drs. Edward H. Basden, Willimantic; Gaert S. Gudernatsch, Sharon; Enos J. O'Connell, Unionville; William H. Pomeroy, Poquonock, and William H. Upson, Suffield.

GEORGIA

Personal.—Dr. William L. Champion, Atlanta, said to be the oldest urologist in Georgia, on July 7 was honor guest at a dinner given by an associate, Dr. Major F. Fowler, Atlanta, at the East Lake Country Club. All members of Fulton County Medical Society were invited to the dinner, which marked Dr. Champion's 83rd birthday.

Hospital Dedicated.—The new 112-bed Hall County Hospital at Gainesville was dedicated by Gov. Herman Talmadge on Aug. 1. Heading the medical staff will be Dr. Cleveland D. Whelchel, Gainesville, with Drs. Clarence G. Butler, Walter R. Garner, Herbert E. Valentine Jr., Bradley B. Davis, and Clyde W. Whitworth, all of Gainesville, composing the executive committee. Drs. Davis and Whitworth are vice-chief of staff and secretary-treasurer, respectively.

ILLINOIS

Narcotic Violation.—Dr. Claude E. Gilliatt, Allendale, pleaded *nolo contendere* to a violation of the federal narcotic law in the United States District Court at Danville, and on June 11 he was fined $150 and costs.

University to Operate Neuropsychiatric Institute.—A bill transferring the Illinois Neuropsychiatric Institute in Chicago to the University of Illinois from the former joint operation by the university and the State Department of Public Welfare has been passed by the Illinois General Assembly and signed by Governor Stevenson. It includes an appropriation of $1,405,700 to the University of Illinois for the operation and maintenance of the institute for the biennium beginning July 1, 1951. Professional services were in charge of Dr. Eric Oldberg and Dr. Francis J. Gerty of the University of Illinois College of Medicine. Funds for nursing service were appropriated to and paid out by the State Department of Public Welfare. Funds for the physical plant, operation of maintenance, and for food service were appropriated to the department, but the services were provided by the university. Under the new plan, all activities and operations of the institute are vested in the University of Illinois. This change was recommended by the Shaefer Commission on State Reorganization and was concurred in by both the university and the State Department of Public Welfare. Dr. Oldberg will serve as director of the division of neurology and neurological surgery and Dr. Gerty as director of the division of psychiatry. The plan will simplify business procedures in the university, the department, and state fiscal offices. The purpose of the institute, as stated by the University of Illinois Board of Trustees, is to act as a liaison between the Illinois State Mental Health Service and the University of Illinois in a cooperative effort to improve the quality of the medical personnel dealing with the patients committed to their care, and to seek new and improved methods of treatment. The operation of the State Psychopathic Institute and the Pathological Laboratory, which are housed in the Illinois Neuropsychiatric Institute, will remain under the State Department of Public Welfare. Dr. Percival Bailey, professor of neurology and neurological surgery at the university, who previously served as executive officer of the institute for the State Department of Public Welfare, will be in charge of these activities for the department. The university, however, will assume the physical operation of the space used by these activities.

Chicago

Dr. Mote Moves to Philadelphia.—Dr. John R. Mote, research scientist responsible for much of the clinical development of corticotrophin (ACTH), has joined the Research and Development Laboratories of Smith, Kline and French Laboratories in Philadelphia as medical director. Formerly medical director and assistant general manager of Armour Laboratories, Dr. Mote will assume his new post with the Philadelphia pharmaceutical research and manufacturing firm in September.

Televised Postgraduate Conference.—The Third Annual Televised Postgraduate Conference in Obstetrics and Gynecology will be given Sept. 24-28 at Lewis Memorial Maternity Hospital. It will be presented by the department of obstetrics and gynecology of the Stritch School of Medicine of Loyola University under the chairmanship of Dr. Herbert E. Schmitz. The conference will include demonstrations of obstetrical procedures and gynecological surgery. The Radio Corporation of America will install television screens throughout the hospital to assure clear viewing and listening. There is no registration fee.

Appoint Dean of Indian Medical College.—Dr. Carroll L. Birch, professor of medicine at the University of Illinois, has been appointed dean of the Lady Hardinge Medical College for Women at New Delhi, India, for one year. The 100-year-old college, endowed by a British noblewoman, is the only Indian medical institution for the training of women. Dr. Birch's specific assignment will be to train a replacement to take over the duties of dean of the college. She also will prepare recommendations for the reorganization of teaching methods and curricula to raise school standards to meet those of modern medical educational institutions.

Research Grants.—Grants for research totalling more than $18,000 have recently been received by the Chicago Medical School. The Eli Lilly Research Laboratories gave $6,000 for work in experimental diabetes under the direction of Dr. Piero P. Foa, associate professor of physiology and pharmacology. The Chicago Heart Association, for the year July 1 to June 30, 1952, made grants of $2,000 and $6,800 for studies to be conducted under the direction of Dr. Aldo A. Luisada, program director of cardiology and assistant professor of medicine, and $4,000 for research directed by Dr. George J. Scheff, associate professor of microbiology.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

INDIANA

Ray Smith Dies.—Ray E. Smith, executive secretary of the Indiana State Medical Association since 1946, died Aug. 4 at his home in Indianapolis, aged 54, of a heart attack. A former newspaper man, and executive secretary to Gov. Henry F. Schricker in 1941, Mr. Smith had served as secretary of the Indianapolis Medical Society and served on a part-time basis for the state medical society at the same time. He was on the State Board of Tax Commission and was recently appointed to the Indiana Council of Mental Health. Last spring he was appointed to the lay public relations advisory committee of the American Medical Association. Mr. Smith was a past president of the Indiana Editorial Association and was a member of Sigma Delta Chi and the Indianapolis Press Club.

KENTUCKY

Historic Medical Gavel.—The Kentucky Surgical Society has received from its first president, Dr. Charles A. Vance, Lexington, a gavel made from wood having historical significance. The wood was collected by the late Dr. Joseph A. Stucky, Lexington, from the first building of the Transylvania Medical College in Lexington, from the home of Dr. Ephraim McDowell, Danville, and from a tree planted by Dr. McDowell in his backyard. Three gavels were made from these sources, one of which Dr. Vance has presented to the Southern Surgical Association and the other to the Southern Medical Association.

Hospital Honors Staff Veteran.—Dr. Michael J. Henry, Louisville, was recently honored by St. Joseph Infirmary at a dinner at the hospital in observance of his 50th anniversary of services. Dr. Henry has been closely connected with St. Joseph infirmary during most of the 50 years since his first job there in 1901 when at the age of 11 he was hired to do odd jobs about the hospital. He has been chairman of the City-County Health Board and president of the Jefferson County Medical Society. Last year he was named to the board of governors of the American College of Surgeons.

LOUISIANA

Center for the Hard of Hearing.—An anonymous gift of $5,000 will help establish a center for the hard of hearing at the Tulane University of Louisiana School of Medicine, New Orleans. Plans call for immediate construction of the center on the sixth floor of Hutchinson Memorial Medical Building. Establishment of a research program in rehabilitation of the deaf, and staffing of the center with research fellows in connection with this program, are planned for the future. Operating as a diagnostic clinic, the center will provide specific services not available in the area which Tulane serves.

MASSACHUSETTS

Personals.—Dr. Thomas S. Sexton has been appointed medical director of the Massachusetts Mutual Life Insurance Company of Springfield.——Dr. James L. Whittenberger, associate professor and head of the physiology department for four years, has been promoted to professor of physiology at the Harvard School of Public Health, Boston.

Appointments at Harvard.—Dr. Otto Krayer has been promoted to professor of pharmacology in the Harvard Medical School, Boston. As head of the department, he also will continue to instruct students and to do research. Dr. Krayer, who has been associate professor of comparative pharmacology since 1940, taught pharmacology at the American University of Beirut, Lebanon, before joining the staff at Harvard in 1937. He is a member of the Pharmacological Study Section of the United States Public Health Service and is on the editorial staff of "Pharmacological Reviews." He served as a member of the Unitarian Service Committee's medical mission to Czechoslovakia in 1946 and as chairman of the Unitarian mission to Germany in 1948. Other appointments include Dr. Jordi Folch-Pi, who becomes associate professor of biological chemistry at McLean Hospital in Waverley, continuing as chief of the biochemical laboratory there, and Dr. Nathan Bill Talbot, who becomes associate professor of pediatrics at Massachusetts General Hospital. Both doctors will carry on their research and teaching activities at the hospitals. Dr. Raymond Delacy Adams has been promoted from assistant professor to associate clinical professor of neurology and chief of the neurological service at Massachusetts General Hospital. He succeeds Dr. Charles S. Kubik in both positions. Dr. Kubik, who has now become lecturer on neuropathology, will continue his neurological research and practice at the hospital.

MICHIGAN

Continuation Courses.—Wayne University College of Medicine, Detroit, is giving postgraduate continuation courses Sept. 10 to Dec. 1, which are open to all qualifying persons. The subjects include microbiology, physiological chemistry, physiology and pharmacology, pathology, dermatology, internal medicine, surgery, and obstetrics. A postgraduate course in the early detection of cancer is to be given throughout the year. It will utilize the facilities of Yates Memorial Clinic, Detroit Receiving Hospital and the Veterans Administration Hospital in Dearborn. Registration should be made with the office of Postgraduate Medical Education at the College of Medicine, 1512 St. Antoine, before Sept. 8. Tuition for the last course is $50 per quarter, and the class is limited to 15.

MISSOURI

General Practitioners Study Club.—The following programs for 1951 featuring local physicians have been arranged by the General Practitioners Study Club of Greater St. Louis:

Sept. 19, Roy V. Boedeker, Practical Procedures in Gynecology for Treatment in the General Practitioners Office.
Oct. 17, James F. Dowd, Treatment of Common Injuries Resulting from Automobile Accidents.
Nov. 21, Adolph C. Lange, Ophthalmic Procedures for the General Practitioner.
Dec. 19, Leo J. LeBlanc, Office Management of Some of the Common Anorectal Diseases.

MONTANA

General Practitioners Meeting.—The Montana chapter of the American Academy of General Practice will hold its annual meeting at the Rainbow Hotel, Great Falls, Sept. 13. Following a dinner meeting at 7 p. m. and a business meeting, Dr. Mark H. Mothersill of the research staff of Eli Lilly and Company, Indianapolis, will speak on "General Practitioners and Allergic Reactions." All physicians are invited to attend. Dr. James A. Mueller, Lewistown, asks that all who plan to attend make their reservation with him not later than Sept. 1.

NEW YORK

Infectious Hepatitis.—Dr. Milton Tully, New York State Department of Health, has reported an outbreak of infectious hepatitis in rural Chemung County. Twenty cases occurred from Jan. 11 to July 8, half of them in June. Cases were found principally in school children and were linked by personal contact.

Bulbar Poliomyelitis Center.—A new center for the clinical study of bulbar and respiratory poliomyelitis will be established at the University of Buffalo's Chronic Disease Research Institute under a grant from the National Foundation for Infantile Paralysis. The respirator center, one of four of its kind to be set up in the United States with March of Dimes funds, will have a capacity of at least ten respirators and will engage in research and clinical investigations on the recovery and rehabilitation of serious poliomyelitis cases. In a ceremony at the institute July 25 the foundation presented to the university its first check of $41,048 for the project. The medical school will immediately begin to prepare, equip, and staff the unit. Dr. Walter T. Zimdahl, medical director of the institute, will co-ordinate the activities of the center with those of the institute. The National Foundation said it selected Buffalo as the location of the new center on the recommendation of the New York State Coordinating Council of Poliomyelitis. Other respirator units sponsored by the foundation are now operating at the Children's Medical Center of Boston, Wellesley Hills, Mass.; at Jefferson Davis Hospital, Houston, Texas, and at University Hospital, Ann Arbor, Mich. In the joint announcement issued by the National Foundation and the University of Buffalo, the purpose of the center was described as three-fold:

1. To determine through special patient evaluation methods and by newer clinical investigative techniques and equipment how best to wean patients from iron lungs and enable them to be cared for at home, with the provision of physical therapists, occupational therapists, and psychological and medical social services to assist in the maximal rehabilitation of patients.
2. To provide opportunity for special study for doctors, nurses, and physical therapists, and more intensive training for resident physicians and medical students in the field of respiratory involvement in poliomyelitis, and to provide consultation and assistive services to hospitals in upstate New York.
3. To evaluate equipment used in diagnosis and treatment, and to cooperate in efforts to develop improvements.

New York City

Hillman Health Center to Expand.—This health center of the Amalgamated Clothing Workers, C. I. O., which opened four months ago (The Journal, May 26, p. 384), must be redesigned to permit the handling of a larger number of patients. The six-story building will be enlarged to include installation of advanced x-ray equipment and a research laboratory for studies in arteriosclerosis. Each week about 1,800 clothing workers go to the center for examination and treatment.

State University Appointments.—James O. Pinkston, Ph.D., has been appointed lecturer in the department of physiology at the State University of New York College of Medicine at New York City. From 1943 to 1950 Dr. Pinkston was dean of the medical division, American University of Beirut, Lebanon, where he had previously served as associate professor and chairman of the department of pharmacology and later as professor and chairman of the department of physiology. Recently he was on the staff of Cornell University Medical College.

OREGON

Rural Health Council.—Twenty-six state-wide organizations concerned with the health of the rural population of the state have organized the Oregon Health Council. Objectives of the council are to bring together representatives of state organizations and agencies which are now conducting programs affecting rural health for the purpose of discussing and exchanging views, and developing recommendations for improving rural health, and to encourage and stimulate the establishment of county or community health councils or committees. Chairman of the council is Dr. Howard A. Wells, Redmond, chairman of the Oregon State Medical Society committee on rural medical service; vice-chairman, Mrs. Amy S. Larkin, Portland, of the farm home administration of the U. S. Department of Agriculture, and secretary, Mrs. Mable C. Mack, Corvallis, Oregon State College Extension Service.

PENNSYLVANIA

Psychiatric Speaker's Bureau.—The Pennsylvania Psychiatric Society has established a speaker's bureau which will furnish, on request, psychiatrists to speak before lay and professional groups. Requests should be addressed to Dr. Stanley W. Conrad, 1822 Spruce St., Philadelphia.

Heart Association Fellowship.—The First Fellowship of the Heart Association of Southeastern Pennsylvania, amounting to an annual grant of $3,000 a year, has been awarded to Dr. Arthur Goldman, Philadelphia, who will work under the jurisdiction of Drs. Thomas M. McMillan and Samuel Bellet, Philadelphia General Hospital.

The Philadelphia Heart Association has changed its name to the Heart Association of Southeastern Pennsylvania because it serves Bucks, Chester, Delaware, and Montgomery counties as well as Philadelphia County. The officers are Dr. Lauritz S. Ylvisaker, president; Dr. Warner F. Haldeman, vice president; Mr. William T. Carter, treasurer, and Dr. Paul H. Parker, secretary.

Philadelphia

New Type Contagious Institution.—In July Philadelphia Hospital for Contagious Diseases opened facilities that will enable the simultaneous hospitalization of various types of contagious diseases. Patients will be quartered in units of two and five beds, each having its own bathing and lavatory facilities, and each with a combined heating and ventilating system capable of changing the air at the rate of 750 cubic feet per minute. A total of 54 patients suffering from various diseases will be cared for. At any time the ward door is opened the lower air pressure inside pulls the air into the ward, thus preventing any contaminated air from finding its way into the corridor. Dedication of this West Wing Observation Building, as it is to be known, was held July 10 with Dr. Rufus S. Reeves, director of public health, presiding.

WASHINGTON

Report of Plague Specimens.—Dr. Vernon B. Link, Western Communicable Disease Center Laboratory, has reported the following specimens obtained in Lincoln County were proved positive for plague: (1) Specimen No. 51-WB-26, consisting of 39 fleas (Megabothris clantoni clantoni) from 43 sagebrush voles (Lagurus curtatus) which were trapped 12 miles southeast of Wilbur, (9.6 miles south on State Highway 4B and then 5 miles east on county road) on July 5; and (2) Specimen No. 51-WB-27, consisting of 137 fleas (61 Thrassis gladiolis johnsoni and 76 Megabothris clantoni clantoni) from 38 Lagurus curtatus, trapped 17 miles north of Odessa, on State Highway No. 4B, on July 7.

GENERAL

Society Election.—At its annual meeting the American Medical Women's Association, Inc., elected Dr. Amey Chappell, Atlanta, president; Dr. Evangeline E. Stenhouse, Chicago, president-elect; Dr. Adelaide Romaine, New York, treasurer; Dr. Esther C. Marting, Cincinnati, recording secretary, and Dr. Irma C. Henderson-Smathers, Asheville, N. C., corresponding secretary.

Dr. Faulkner Heads Specialty Board.—Dr. Robert L. Faulkner, Cleveland, has been elected secretary-treasurer of the American Board of Obstetrics and Gynecology, to succeed the late Dr. Paul Titus. Dr. Lawrence M. Randall, Rochester, Minn., has been elected assistant secretary, and Dr. Herbert E. Schmitz, Chicago, a director of the board. Effective Aug. 10, the office of the board will be located at 2105 Adelbert Road, Cleveland 6. All correspondence should be directed to Dr. Faulkner at this address.

Dr. Hussey Named to Editorial Staff.—Dr. Hugh H. Hussey, associate professor of medicine at Georgetown University, Washington, D. C., has been appointed associate editor of *GP*, published by the American Academy of General Practice. Dr. Hussey has for years been associate editor of the *Medical Annals of the District of Columbia*. He is author of the section on "Supportive and Symptomatic Therapy" in the textbook "Fundamentals of Internal Medicine" now in its third edition. He carries on a consultation practice in Washington and is a member of the staff of Gallinger Municipal Hospital and the Georgetown University Hospital and is senior consultant on vascular diseases at the Mount Alto Veterans Hospital.

Tuberculosis Service Workers' Course.—The National Tuberculosis Association will conduct a general training course for new professional workers at Roycroft Inn, East Aurora, New York, Sept. 4-29. The course is open to staff members of state and local tuberculosis associations who have had at least one month of experience and not more than 10 months, and to college graduates seeking careers in the tuberculosis field. The course is designed to acquaint new workers with basic concepts and techniques in voluntary tuberculosis association work. Field trips will supplement the formal curriculum, which includes lectures on all phases of social service work for the tuberculous.

Gold Heart Awards.—These awards for outstanding contributions to cardiovascular medicine or the American Heart Association were presented at the association's annual dinner in Atlantic City in June to Drs. James B. Herrick, Frank N. Wilson, and Harold M. Marvin. Dr. Herrick, emeritus professor of medicine at the University of Chicago and the University of Illinois, was honored for his work on coronary thrombosis. Dr. Wilson, professor of medicine at the University of Michigan, received the award for his investigations in the field of electrocardiography. Dr. Marvin, New Haven, Conn., received the Gold Heart for his many years of service to the association, including the presidency in 1949-1950.

Prevalence of *Poliomyelitis.*—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States in the weeks ended as indicated:

Area	Aug. 4, 1951	Aug. 5, 1950
New England States		
Maine	1	1
New Hampshire	9	..
Vermont	2	..
Massachusetts	19	9
Rhode Island	..	2
Connecticut	12	7
Middle Atlantic States		
New York	65	95
New Jersey	17	24
Pennsylvania	35	49
East North Central States		
Ohio	37	44
Indiana	10	14
Illinois	81	77
Michigan	73	41
Wisconsin	34	23
West North Central States		
Minnesota	28	13
Iowa	14	46
Missouri	12	15
North Dakota	5	1
South Dakota	5	2
Nebraska	23	19
Kansas	36	29
South Atlantic States		
Delaware	1	1
Maryland	1	11
District of Columbia	4	15
Virginia	11	88
West Virginia	9	19
North Carolina	21	41
South Carolina	3	26
Georgia	49	30
Florida	16	12
East South Central States		
Kentucky	15	42
Tennessee	30	45
Alabama	43	12
Mississippi	38	18
West South Central States		
Arkansas	23	11
Louisiana	34	29
Oklahoma	52	35
Texas	92	122
Mountain States		
Montana	2	3
Idaho	..	2
Wyoming	9	3
Colorado	71	7
New Mexico	2	6
Arizona	3	2
Utah	23	2
Nevada	1	..
Pacific States		
Washington	8	9
Oregon	14	7
California	110	76
Territories and Possessions		
Alaska	..	..
Hawaii	1	2
United States	1,204	1,187

Mississippi Valley Society Meetings.—The Mississippi Valley Medical Society will hold its annual meeting at the Hotel Pere Marquette, Peoria, Ill., Sept. 19-21, under the presidency of Dr. Ralph McReynolds, Quincy, Ill. Thirty-two scientific papers will be presented. The visiting speaker will be Dr. Oscar C. Hansen-Pruss, professor of medicine at The Duke University, Durham, N. C. There will be round table luncheons Thursday and Friday. Speakers at the evening fellowship hour, banquet, and entertainment on Thursday will be Drs. C. Paul White, Kewanee, Ill.; C. Edgar Virden, Kansas City, Mo.; Donald C. Conzett, Dubuque, Iowa, and Alexander Baird, Ph.D., Peoria, Ill. There is no registration fee.

The American Medical Writers' Association will meet at the hotel on Sept. 19 under the presidency of Dr. Julius Jensen, St. Louis. The session, beginning in the afternoon, will be addressed by Dr. Richard M. Hewitt, head of the section of publications, Mayo Clinic, Rochester, Minn. Other speakers will be Miss Marguerite Stadelhofer, managing editor of C. V. Mosby Company, medical publishers, who will speak on "The Making of Medical Books." At the evening session Dr. Ralph H. Major, professor of medicine and of the history of medicine at the University of Kansas City, Kansas City, Mo., will speak on "Some of the Great Books of Medicine."

American Cancer Society Fellowship Awards.—Three Chicago scientists have been awarded fellowships for cancer research totaling $13,000 for studies of growth processes in plants and animals. Dr. John M. Marshall Jr. will study for one year at the Carlsberg Laboratory in Copenhagen, Denmark, where he will investigate the method by which plant constituents are isolated and purified. Robert C. Barnett, Ph.D., and Richard M. Klein, Ph.D., both of the University of Chicago, will conduct their research there. These scientists were selected from applicants in all parts of the country and were recommended for American Cancer Society fellowships by the Committee on Growth of the National Research Council.

FOREIGN

Communicable Diseases.—According to reports received by the regional office of the World Health Organization, an outbreak of poliomyelitis has been in progress in Mexico City since the first part of May. Since then over 400 cases have been reported. The peak of the outbreak apparently was reached in the week ending June 23 when there were 100 new cases. For the weeks ending June 30 and July 7, there were 54 and 40 cases, respectively, reported. For the week ending July 14, there were 12 new cases in the city of Birmingham, England.

A high prevalence of diphtheria continues in Rio de Janeiro, Brazil, 86 cases with nine deaths being reported for the three-week period ending on July 7. In Santiago, Chile, 45 cases and one death occurred in the week ending July 7; and in San Jose, Costa Rica, there were 10 cases in the second week of July. In Bangkok, Thailand, and in Singapore, 20 and eight cases, respectively, were reported for one week early in July. According to a World Health Organization report, there were 1,419 cases of brucellosis in Italy in May as compared with 1,172 in April. During the first two weeks of June 37 cases were reported on the Island of Malta and Gozo. In the cities of Spain with less than 20,000 population, there was a total of 618 cases with five deaths reported in a seven-week period ending April 14. In cities with more than 20,000 population only 17 cases were reported in the same period.

MEETINGS

Ambulatory Fracture Association, *Arrowhead Springs Hotel*, San Bernardino, Calif., Oct. 8-11. Dr. H. W. Wellmerling, 626 Griesheim Bldg., Bloomington, Ill., Secretary.

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, The Homestead, Hot Springs, Va., Sept. 6-8. Dr. William F. Mengert, 2211 Oak Lawn Ave., Dallas, Texas, Secretary.

American Congress of Physical Medicine, Shirley-Savoy Hotel, Denver, Sept. 4-8. Dr. Walter J. Zeiter, 2020 E. 93d St., Cleveland 6, Executive Director.

American Hospital Association, St. Louis, Sept. 17-20. Mr. George Bugbee, 18 E. Division St., Chicago 10, Executive Director.

American Roentgen Ray Society, Washington, D. C., Sept. 25-28. Dr. Barton R. Young, Germantown Hospital, Philadelphia 44, Secretary.

American Society of Maxillofacial Surgeons, Drake Hotel, Chicago, Sept. 23-26. Dr. Casper M. Epsteen, 25 E. Washington St., Chicago 2, Secretary.

Association of Military Surgeons of the United States, Palmer House, Chicago, Oct. 8-10. Colonel James M. Phalen, Armed Forces Institute of Pathology, Washington 25, D. C., Secretary.

Colorado State Medical Society, Denver, Sept. 18-21. Mr. Harvey T. *Sethman, 1612 Tremont Place*, Denver 2, Executive Secretary.

Delaware, Medical Society of, Wilmington, Oct. 8-10. Dr. Andrew H. Gehret, 1007 Park Place, Wilmington, Secretary.

District of Columbia, Medical Society of, Hotel Statler, Washington, Oct. 1-3. Mr. Theodore Wiprud, 1718 M St. N.W., Washington, Secretary.

Kansas City Southwest Clinical Society, Municipal Auditorium, Kansas City, Mo., Oct. 1-4. Dr. Maxwell G. Berry, 630 Shukert Bldg., Kansas City, Mo., Director of Clinics.

Kentucky State Medical Association, Columbian Auditorium, Louisville, Oct. 2-5. Dr. Bruce Underwood, 620 S. Third St., Louisville 2, Secretary.

Michigan State Medical Society, Grand Rapids, Sept. 26-28. Dr. L. Fernald Foster, 606 Townsend St., Lansing 15, Secretary.

Mississippi Valley Medical Society, Peoria, Ill., Sept. 19-21. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.

Montana Medical Association, Great Falls, Sept. 13-16. Mr. L. R. Hegland, 104 N. Broadway, Billings, Executive Secretary.

Nashville Postgraduate Medical Assembly, Maxwell House, Nashville, Tenn., Oct. 3-5. Dr. W. G. Kennon Jr., 647 Doctors Bldg., Nashville 3, Secretary.

National Medical Association, Philadelphia, Aug. 20-24. Dr. John T. Givens, 1108 Church St., Norfolk 10, Va., General Secretary.

Neurosurgical Society of America, Sun Valley, Idaho, Sept. 12-14. Dr. C. D. Hawkes, 22 N. Manassas St., Memphis 5, Tenn., Secretary.

Nevada State Medical Association, Riverside Hotel, Reno, Sept. 13-15. Dr. Wesley W. Hall, 307 W. Sixth St., Reno, Secretary.

New Hampshire Medical Society, Equinox House, Manchester, Vermont, Sept. 30-Oct. 2. Dr. Deering G. Smith, 44 Chester St., Nashua, Secretary.

Northeastern Section, Southeastern Surgical Congress, Lord Baltimore Hotel, Baltimore, Sept. 13-15. Dr. W. Raymond McKenzie, Medical Arts Bldg., Baltimore 1, Secretary.

North Texas-Southern Oklahoma Fall Clinical Conference, Wichita Falls, Texas, Sept. 19. Dr. W. L. Powers, 517 Hamilton Bldg., Wichita Falls, Chairman.

Oregon State Medical Society, Masonic Temple, Portland, Oct. 10-13. Dr. Robert F. Miller, 833 S.W. Eleventh Ave., Portland 5, Secretary.

Pennsylvania, Medical Society of the State of, Pittsburgh, Sept. 16-20. Dr. Walter F. Donaldson, 500 Penn Ave., Pittsburgh 22, Secretary.

Reno Surgical Society Conference, Riverside Hotel, Reno, Nev., Aug. 23-25. Dr. Olin C. Moulton, 130 N. Virginia St., Reno, Nev., Chairman.

Southwestern Surgical Congress, Hotel Jefferson, St. Louis, Sept. 24-26. Dr. C. R. Rountree, 1227 Classen St., Oklahoma City 3, Secretary.

Texas Academy of General Practice, Shamrock Hotel, Houston, Texas, Sept. 10-11. Dr. B. H. Bayer, 104 E. 20th St., Houston 8, Secretary.

U. S. Chapter, International College of Surgeons, Palmer House, Chicago, Sept. 10-14. Dr. Arnold S. Jackson, 1516 Lake Shore Drive, Chicago, Executive Secretary.

Utah State Medical Association, Salt Lake City, Sept. 13-15. Dr. T. C. Weggeland, 42 S. Fifth East St., Salt Lake City, Secretary.

Vermont State Medical Society. Equinox House, Manchester, Sept. 30-Oct. 2. Dr. James P. Hammond, 542 Main St., Bennington, Secretary.

Virginia, Medical Society of, Virginia Beach, Oct. 7-10. Mr. Richard H. Nash, 1105 W. Franklin St., Richmond, Executive Secretary.

Washington State Medical Association, Olympic Hotel, Seattle, Sept. 9-12. Dr. James W. Haviland, 338 White-Henry-Stuart Bldg., Seattle, Secretary.

Western Society of Electro-Encephalography, Olympic Hotel, Seattle, Sept. 7-8. Dr. Nicholas A. Bercel, 450 N. Bedford Drive, Beverly Hills, Calif., Secretary.

Wiscnosin, State Medical Society of, Hotel Schroeder and Milwaukee Auditorium, Milwaukee, Oct. 1-3. Mr. Charles H. Crownhart, 704 E. Gorham St., Madison 3, Secretary.

Wyoming State Medical Society, Rock Springs, Sept. 27-29. Dr. Glenn W. Koford, 2020 Carey Ave., Cheyenne, Secretary.

INTERNATIONAL

European Congress on Rheumatism, Barcelona, Spain, Sept. 24-27. Dr. Gunnar Edströn, Lund, Sweden, Secretary.

General Practitioners Study Club International, Rome, Italy, Sept. 12-15. Dr. John O'Connell, 10300 Lackland Road, St. Louis 14, Mo., U. S. A., President.

International Anesthesia Research Society, London, England, Sept. 3-7. Mr. R. W. Cope, University College Hospital, London W.C.1, England.

International Association of Allergists, Zurich, Switzerland, Sept. 23-29. Prof. A. S. Grumbach, Hygiene Institut der Universitaet Zurich, Gloriastr. 32, Zurich, Switzerland.

International Congress of Anesthesiology, Nursing School of the Salpiettre, 47 Boul de l'Hospital, Paris, France, Sept. 20-22. 12 rue de Seine, Paris 6^e, France, Secretariat.

International Congress on Entomology, Amsterdam, Holland, Aug. 17-24. Dr. J. de Wilde, 136 Rapenburgerstraat, Amsterdam, Secretary.

International Congress on Industrial Medicine, Instituto Superior Técnico, Lisbon, Portugal, Sept. 9-15. Dr. Luis Guerreiro, Instituto Nacional do Trabalho e Previdência, Praça do Comercio, Lisbon, Secretary General.

International Congress on Mental Health, Mexico City, Mexico, Dec. 11-19. Mrs. Grace E. O'Neill, Division of World Affairs, National Association on Mental Health, 1790 Broadway, New York 19, N. Y.

International Congress of Physical Medicine, London, England, July 14-19. Dr. A. C. Boyle, 45, Lincoln's Inn Fields, London, W.C.2, England, Honorary Secretary.

International Gerontological Congress, Hotel Jefferson, St. Louis, Mo., U. S. A., Sept. 9-14. Dr. John E. Kirk, 5600 Arsenal Street, St. Louis 9, Mo., Chairman, Program Committee.

International Poliomyelitis Congress, Copenhagen, Denmark, Sept. 3-7. Prof. Dr. Niels Bohr, Statens Seruminstitut, 80 Amager Blvd., Copenhagen S., Denmark, President.

International Society of Surgery, Paris, France, Sept. 24-29. Dr. L. Dejardin, 141, rue Belliard, Brussels, Belgium, Secretary General.

International Society for the Welfare of Cripples, Fifth World Congress, Stockholm, Sweden, Sept. 9-14. Mr. Donald V. Wilson, 54 E. 64th St., New York 21, N. Y., U. S. A., Executive Director.

Pan Pacific Surgical Association Congress, Honolulu, Hawaii, Nov. 7-19. Dr. Forrest J. Pinkerton, Suite 7, Young Bldg., Honolulu, Hawaii, President.

World Confederation for Physicial Therapy, Copenhagen, Denmark, Sept. 7-8.

World Medical Association, Stockholm, Sweden, Sept. 15-21. Dr. Louis H. Bauer, 2 E. 103d St., New York 29, N. Y., U. S. A., Secretary General.

EXAMINATIONS AND LICENSURE

BOARDS OF MEDICAL EXAMINERS

Alabama: *Examination.* Montgomery, June 24-26, 1952. Sec., Dr. D. G. Gill, 537 Dexter Ave., Montgomery 4.

Arkansas:* *Regular.* Little Rock, Nov. 8-9. Sec., Dr. Joe Verser, Harrisburg.

California: *Written.* San Francisco, Aug. 20-23. *Oral.* Los Angeles, August 18. *Oral and Clinical Examination for Foreign Medical School Graduates.* Los Angeles, August 19. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

Colorado:* *Reciprocity.* Denver, Oct. 9. Final date for filing application is Sept. 24. Ex. Sec., Mrs. Beulah H. Hudgens, 831 Republic Bldg., Denver 2.

Georgia: Atlanta, June. August, Oct. 9-11. Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta.

Guam: The Commission on Licensure will meet whenever a candidate appears or submits his credentials. Ex. Sec., Dr. John Y. Battenfield, Agana.

Illinois: Chicago, Oct. 9-11. Superintendent of Registration, Mr. Charles F. Kervin, Capitol Building, Springfield.

Indiana: Indianapolis, June 1952. Sec., Dr. Paul R. Tindall, 1138 K of P Bldg., Indianapolis 4.

Kansas: Topeka, Dec. 12-13. Sec., Dr. O. W. Davidson, 772 New Brotherhood Bldg., Kansas City.

Kentucky: *Examination.* Louisville, Dec. 11-13. Sec., Dr. Bruce Underwood, 620 S. 3rd St., Louisville.

Maryland: *Examination.* Baltimore, Dec. 11-14. Sec., Dr. Lewis P. Gundry, 1215 Cathedral St., Baltimore.

Michigan:* *Examination.* Lansing, Oct. 10-12. Sec., Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing.

Minnesota: * Minneapolis, Oct. 16-18. Sec., Dr. Julian F. DuBois, 230 Lowry Medical Arts Bldg., St. Paul 2.

Mississippi: *Reciprocity.* Jackson, December. Asst. Sec., Dr. R. N. Whitfield, Old Capitol Bldg., Jackson.

New Hampshire: Concord, Sept. 12-13. Sec., Dr. John Samuel Wheeler, Room 107 State House, Concord.

New Jersey: *Examination.* Trenton, Oct. 16-19. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

New Mexico:* Santa Fe, Oct. 8-9. Sec., Dr. Charles J. McGoey, Coronado Bldg., Santa Fe.

New York: *Examination.* Albany, Buffalo, New York and Syracuse, Oct. 31-Nov. 3. Sec., Dr. Jacob L. Lochner, Jr., 23 S. Pearl St., Albany.

North Carolina: Asheville, Oct. 7-8. Sec., Dr. Joseph J. Combs, Professional Bldg., Raleigh.

Ohio: *Examination.* Columbus, December. *Reciprocity.* Columbus, Oct. 2. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus 15.

Oregon:* *Reciprocity.* Portland, Oct. 12-13. Ex. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland.

Puerto Rico: *Examination.* Santurce, Sept. 4-7. Sec., Mr. Luis Cueto Coll, Box 3717, Santurce.

South Carolina: *Reciprocity.* Columbia, Sept. 10 and Oct. 1. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

South Dakota:* *Examination.* Sioux Falls, Jan. 15-16. Ex. Sec., Mr. John C. Foster, 300 First National Bank Bldg., Sioux Falls.

Virgin Islands: Charlotte Amalie, Nov. 7-8. Sec., Dr. Earle M. Rice, St. Thomas.

Wyoming: *Examination.* Cheyenne, Oct. 1. Sec., Dr. Franklin D. Yoder, State Capitol, Cheyenne.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Arizona: *Examination.* Tucson, Sept. 18. Sec., Mr. Francis A. Roy, 423 Liberal Arts Bldg., University of Arizona, Tucson.

Connecticut: *Examination.* New Haven, Oct. 13. Exec. Asst., Miss Mary G. Reynolds, State Board of Healing Arts, 110 Whitney Avenue, New Haven 10.

District of Columbia: *Examination.* Washington, Oct. 22-23. Sec., Dr. Daniel L. Seckinger, 4130 E. Municipal Bldg., Washington.

Michigan: Detroit and Ann Arbor, Oct. 12-13. *Examination.* Sec., Miss Eloise LeBeau, 501 W. Michigan Ave., Lansing 15.

Minnesota: *Examination.* Minneapolis, Oct. 2-3. Sec., Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis.

Nebraska: *Examination.* Omaha, Oct. 2-3. Director, Bureau of Examining Boards, Mr. Oscar F. Humble, Room 1009, State Capitol Bldg., Lincoln 9.

Oklahoma: *Oklahoma City, Sept. 14. Sec.,* Dr. Frank C. Gallaher, 813 Braniff Bldg., Oklahoma City 4.

Oregon: *Examination. Portland, Sept. 8 and Dec. 1. Sec., Dr.* Charles D. Byrne, State Board of Higher Education, University of Oregon, Eugene.

South Dakota: *Examination.* Vermillion, Dec. 7-8. Sec., Dr. Gregg M. Evans, 310 E. 15th St., Yankton.

Texas: *Examination:* Austin, October. Chief Clerk, Mr. B. H. Kirk, 306 Nalle Bldg., Austin.

Wisconsin: *Examination.* Madison, Sept. 22. Sec., Mr. W. H. Barber, Ripon College, Ripon.

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* Basic Science Certificate required.

DEATHS

MacNider, William de Berniere ⊕ Chapel Hill, N. C.; born in Chapel Hill June 25, 1881; University of North Carolina School of Medicine, Chapel Hill, 1903; Kenan research professor of pharmacology, emeritus, at his alma mater, which he had joined in 1905 as Kenan professor of pharmacology, becoming Kenan research professor of pharmacology in 1920, and serving as dean from 1937 to 1940; the William B. MacNider Award was established at the school in 1951 for public commendation of a sophomore medical student possessing the traits of character typified by Dr. MacNider during his 50 years as teacher and physician in the university; at various times special lecturer at Columbia University in New York, George Washington University School of Medicine, Washington, D. C., Medical College of Virginia, Richmond, Mayo Foundation, Rochester, Minn., and The Duke University School of Medicine, Durham, N. C.; formerly Harvey Society lecturer; consultant on gerontology, National Institutes of Health, Bethesda, Md.; chairman, Section on Pharmacology and Therapeutics of the American Medical Association, 1926-1927; member of the National Board of Medical Examiners and chairman of the examination committee, member of the National Research Council committee on nutritional aspects of ageing, the committee on cellular physiology, executive committee of the medical division; chairman of the American Division of the International Club for Research on Ageing; fellow of the American Association for the Advancement of Science, American Academy of Arts and Sciences, and the American College of Physicians; member of the American Society for Pharmacology and Experimental Therapeutics (president from 1932 to 1934, and member of the council), president of the Medical Society of the State of North Carolina (1925-1926), member of the American Physiological Society, American Association of Pathologists and Bacteriologists, American Association of Biological Chemists, Society of Experimental Biology and Medicine (president 1941-1942), American Association of University Professors, American Society for Experimental Pathology, Association of American Physicians, American Society of Anethetists, National Anaesthesia Research Society and member of the research committee, International Anaesthesia Research Society (president 1934-1935), American Association for the History of Medicine, North Carolina Academy of Science, National Academy of Sciences, New York Academy of Sciences, American Society of Naturalists, American Philosophical Society, and the Harvey Society; honorary member of the Pathological Society of Great Britain and Ireland; associate foreign member of the British Physiological Society; chairman of the council of the Gerontological Society; member of Sigma Xi, Sigmu Nu, Phi Beta Kappa, and Alpha Omega Alpha; was awarded the George M. Kober Medal in 1941 by the Association of American Physicians for research on injury to tissue cells, the New York Academy of Medicine's Edward M. Gibbs Memorial Prize in 1931; two years later was presented with the Southern Medical Association research medal; on the editorial board of the *Quarterly Journal of Studies on Alcohol;* contributor of articles to medical and biological journals; received the honorary degrees of doctor of science from the Medical College of Virginia in 1933 and doctor of laws from Davidson College in 1934; on the honorary staff of Watts Hospital in Durham, where he died May 31, aged 70, of congestive heart disease.

Morrison, Richard John, Santa Monica, Calif.; born in Glasgow, Scotland, June 22, 1880; Loyola University School of Medicine, Chicago, 1918; member of the American Medical Association; past president of Santa Monica Medical Society; president of the Marion Davies Child Guidance Clinic; chairman of the Santa Monica Welfare Clinic staff; served on the staffs of the Los Angeles County Hospital in Los Angeles and Santa Monica Hospital; past president of the Lions Club; served with the Salvation Army in Java two years during his early medical career; died May 28, aged 70, of coronary occlusion.

Maybaum, Jacob Louis ⊕ New York; Cornell University Medical College, New York, 1905; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology, American Laryngological, Rhinological and Otological Society, and the American Otological Society; fellow of the American College of Surgeons; consulting otologist, Mount Sinai Hospital, where he died May 31, aged 67, of congestive heart failure.

Morrow, Roy Darlington ⊕ Connersville, Ind.; Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1907; past president of the Fayette-Franklin Counties Medical Society; served during World War I; on the staff of Fayette Memorial Hospital; died May 30, aged 67, of coronary occlusion.

Potter, La Forest, Haverford, Pa.; Boston University School of Medicine, 1884; died in St. Agnes Hospital, Philadelphia, recently, aged 85, of carcinoma of the esophagus.

Richardson, Elbert Leech, Louisville, Miss.; University of Nashville (Tenn.) Medical Department, 1907; member of the American Medical Association; for many years county health officer; past president of the East Mississippi Medical Association; died May 26, aged 69.

Rosamond, John Stribling, West, Miss.; Memphis (Tenn.) Hospital Medical College, 1901; member of the American Medical Association; medical examiner for Selective Service during World War I; for many years president of the county board of education, county health officer, and local surgeon for the Illinois Central Railroad; affiliated with Holmes County Community Hospital in Lexington and the District Two Community Hospital in Durant; died May 29, aged 77, of injuries received in an automobile accident.

Smith, Charles Edgar, Beloit, Wis.; Northwestern University Medical School, Chicago, 1901; past president of the hospital staff, Beloit Hospital; died May 21, aged 78, of coronary thrombosis and arteriosclerotic heart disease.

Southworth, Hamilton Munn, Owensburg, Ind.; Albany (N. Y.) Medical College, 1905; served during World War I; died May 26, aged 70, of cerebral hemorrhage.

Stocks, John Carter, Bountiful, Utah; Northwestern University Medical School, Chicago, 1911; member of the American Medical Association; formerly mayor of Bountiful and city councilman; died in a hospital in Ogden May 28, aged 72, of coronary occlusion.

Strong, Sneed, Dallas, Texas; Missouri Medical College, St. Louis, 1891; served during World War I; formerly affiliated with the Veterans Administration; died in the Veterans Administration Hospital, Waco, May 12, aged 86, of arteriosclerosis.

Waldrep, Archie C., Red Bay, Ala.; University of Louisville (Ky.) Medical Department, 1893; member of the American Medical Association; died May 26, aged 82, of coronary thrombosis.

Walters, John K., Mooresburg, Tenn. (licensed in Tennessee in 1892); died in East Tennessee Baptist Hospital, Knoxville, May 25, aged 86, of coronary thrombosis.

Whitacre, John Clifford ⊕ St. Paul; University of Minnesota College of Medicine and Surgery, Minneapolis, 1901; died May 28, aged 74, of coronary thrombosis.

Wight, William G. ⊕ Yale, Mich.; Trinity Medical College, Toronto, Canada, 1890; served as mayor of Yale and as president of the Yale Bank; affiliated with Yale Hospital and the Port Huron (Mich.) Hospital; died in Women's Hospital, Detroit, May 28, aged 83, of myocardial infarction.

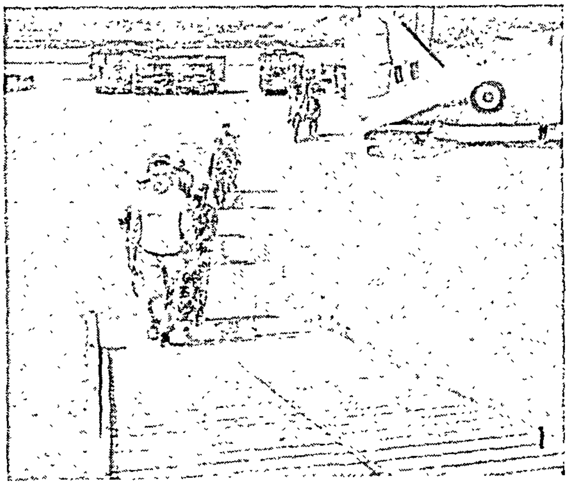
Wiley, Edwin Hardin ⊕ Los Angeles; Northwestern University Medical School, Chicago, 1901; fellow of the American College of Surgeons; on the consulting staff of St. Joseph's Hospital in Burbank, Calif., and on the staff of California Hospital, where he died May 28, aged 73, of carcinoma of the pancreas with metastases.

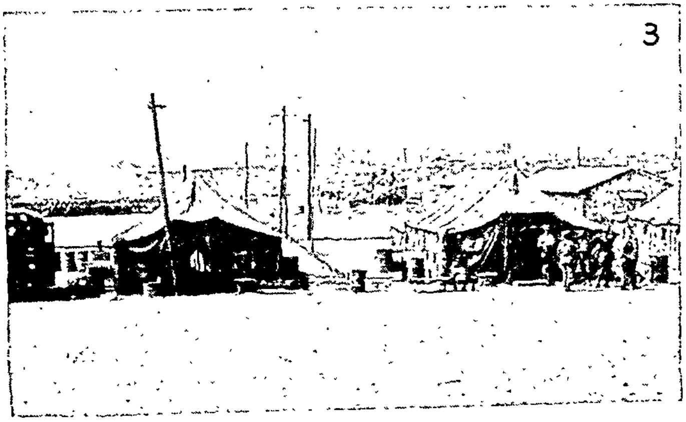
⊕ Indicates Fellow of the American Medical Association.

GOVERNMENT SERVICES

AIR EVACUATION OF PATIENTS IN KOREA

Korea (Fig. 1).—This is the beginning of an Air Force medical air evacuation. These casualties on litters from Korea will be flown to Japan for screening. The patients are being carried aboard a Douglas C-54 "Skymaster" of the USAF Troop Carrier Command.



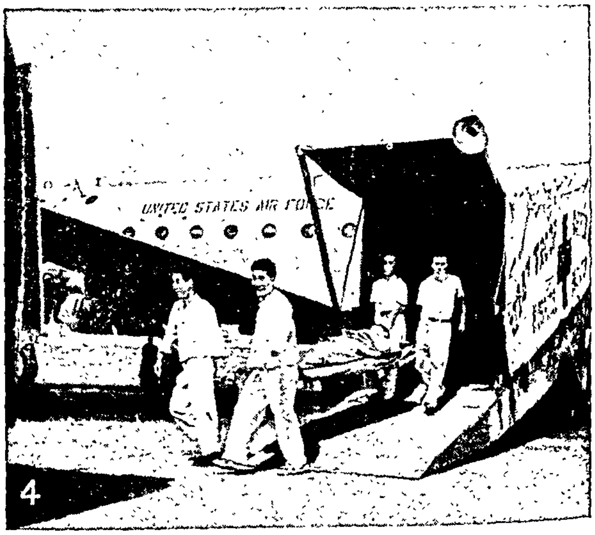


Tachikawa, Japan (Fig. 2).—Just in from an air evacuation flight from Korea, a flight nurse and a medical technician carry their medical gear from the C-54 Douglas "Skymaster" that acted as a flying hospital. Combat casualties, picked up at a Korean airstrip, have been already unloaded into ambulances and are on their way to service hospitals for treatment and screening.

Korea (Fig. 3).—This hospital on the edge of an operational airstrip is 30 minutes from the front lines. Medical technicians are readying combat casualties for medical air evacuation flights to Japan, the first leg of the air evacuation trans-Pacific crossing of the Pacific Airlift.

Tachikawa, Japan (Fig. 4).—Japanese civilian employees carry a Korean combat casualty from an Air Force C-54 Douglas "Skymaster" to a waiting ambulance for hospitalization. Air evacuation of wounded has been a major development of the Korean conflict.

Korea (Fig. 5).—The combat casualties start home by air from a dusty Korean airstrip. Medical technicians like these checking litter straps in this Air Force C-54 "Skymaster" transport, will tend the wounded through their flight to Japan and later, on the Pacific Airlift, to Continental United States.



ARMY

Malaria in Veterans Who Have Served in Korea.[1]—There are now returning from Korea many members of the Armed Forces who, while in combat, were exposed to the disease hazards of that country. The most common diseases encountered there have been bacillary dysentery, malaria, typhoid fever, typhus fever, infectious hepatitis, Japanese B encephalitis, and smallpox. By means of sanitary measures and specific immunization, Allied troops have been kept almost free of typhoid fever, typhus fever, and smallpox. Cases of dysentery, hepatitis, and encephalitis have been relatively few in number; current control measures are reasonably effective in preventing the importation of these diseases into the United States by returning troops, and research is directed toward improving preventive measures in order to eliminate even the few infections which do occur among men operating in the endemic area. Malaria, therefore, of these diseases, is one most likely to occur among veterans who have returned to the United States.

For the control of malaria, suppressive therapy with chloroquine is employed between April and October by all ground and air force personnel stationed in Korea. This is supplemented by mosquito control measures wherever possible, but the possibilities for individual exposure are greater in forward combat areas. Unavoidably, a certain number of men are bitten by infected mosquitoes, and the primary attack of malaria is usually suppressed by chloroquine therapy at that time. Since the predominant type of malarial parasite in Korea is a Temperate Zone variety of Plasmodium vivax which has a characteristically long latent period, the delayed primary attack may occur from 250 to 300 days after the infection, particularly if the individual was on suppressive therapy at the time of infection. Thus their attacks are usually seen in the late spring and early summer. For instance, among Army troops stationed in the United States, six malaria cases were reported in January of this year, eight cases in February, 24 in March, 74 in April, 309 in May, and 939 in June. Almost without exception, these patients contracted their infection in Korea. The Navy and Air Force have had comparable experiences, although of lesser magnitudes. A large number of cases may be expected in July with a diminution occurring in August and September, and another wave of attacks will probably occur next spring. Since it is neither desirable nor feasible to continue suppressive measures indefinitely and since there are no practical laboratory procedures for screening large numbers of men in order to determine infected individuals in advance of the primary attack, the Armed Services are investigating the possibility of using a new, relatively nontoxic, antimalarial compound for treating all men returning from Korea.

The treatment of cases which occur within the military service has constituted no particular problem. The cases have responded well to either chloroquine alone or chloroquine plus quinine. Although chloroquine does not prevent the occurrence of relapses of vivax infections, its administration is followed by a longer interval of freedom from attack than is observed with quinacrine (atabrine®) hydrochloride or quinine. It causes fewer reactions than other available drugs. The most frequent reaction is pruritus without rash, particularly of the palms, which occurs in about 10% of treated patients. Mild anorexia, nausea, and vertigo seldom justify discontinuance of the drug.

Chloroquine is available as chloroquine diphosphate, 0.5 gm. tablets (equivalent to 0.3 gm. base). The usual schedule used in military hospitals consists of two 0.5 gm. tablets initially followed by a single tablet after an interval of eight hours. Subsequently, single 0.5 gm. doses are given on each of the following two or three days. This schedule may be combined with quinine sulfate, 0.3 gm. orally three times a day, but ordinarily chloroquine alone is sufficient. In an endemic area, suppressive doses of chloroquine diphosphate, 0.5 gm., should be given weekly, beginning one week after the cessation of treatment and continued until four weeks after the last possible exposure.

If it were not for the fact that soldiers, sailors, and airmen occasionally have leave and many are now eligible for separation from military service, the delayed primary attacks and relapses of malaria that occur among men infected in Korea would all be treated in military hospitals. However, attacks do occur when individuals are absent from their military post, and as a result of the stepped-up separation program an increasing number will be experienced in civilian medical practice. It may be expected that the attacks will be diffusely scattered. Hence, members of the medical profession can expect to see some malaria cases among patients who are veterans of Korea.

In general, these cases of malaria are not expected to reestablish malarial infection in this country to any appreciable degree. Through cooperative efforts of the Federal, state, and local health authorities, and the practicing physicians, malaria has been almost eradicated in the United States. Control measures are now concentrated on the individual blood-positive cases. Thus, the success of the national program depends on early diagnosis and prompt reporting of all cases to appropriate health authorities. Human infection during the latent period generally is not communicable to mosquitoes. Patients with acute or chronic malaria are most infectious for mosquitoes. This period of communicability can be materially shortened by adequate medical treatment. Screening and residual insecticides should be utilized in the environment of each recognized case.

Army Postgraduate Program Extended.—A new series of postgraduate short courses for armed forces medical officers will considerably extend the Army's graduate professional education program, according to the Office of the Army Surgeon General. The new program is in keeping with the Army Career Management Plan, which provides a continuance of professional education throughout the military career of all Medical Corps and Dental Corps officers of the Army Medical Service.

A total of 18 courses will be given at five Army hospitals, the Armed Forces Institute of Pathology, and the Medical Service Graduate School, Washington, D. C., during the last six months of this year. Two courses of internal medicine are included. Other courses will be given in the second half of fiscal year 1952. (Naval and Air Force medical officers have been invited to attend these courses.)

The first of the two internal medicine courses, "Present Trends in Internal Medicine," will be given at Walter Reed Army Hospital, Washington, D. C., Oct. 8-12. Attendance will be limited to personnel from the First, Second, and Third Army Areas and the Military District of Washington. The second of the two courses, "Recent Advances in Internal Medicine," will be held at Letterman Army Hospital, San Francisco, Nov. 5-9. Attendance will be limited to personnel from the Fourth, Fifth, and Sixth Army Areas. Both courses will utilize lectures, conferences, round table discussions, and clinics.

Medical officers on active duty will be given priority in the allotment of spaces. Applications from medical officers on active duty will be forwarded through channels to: The Office of The Surgeon General, Department of the Army, Attention: Personnel Division, Washington 25, D. C. Applications from Air Force and Naval medical officers should be forwarded through regular channels. Applications from medical officers not on active duty and civilian physicians should be forwarded through channels to the commander of the installation offering the course. The commander will select those to attend on a space available basis. Army medical officers enrolled in the residency training program may attend these courses only if they are given at a hospital where the resident is being trained.

DEPARTMENT OF DEFENSE

August Induction of Medical Officers Delayed.—The planned induction under Selective Service of 333 Priority I medical officers scheduled during the month of August has been delayed temporarily at the request of the Department of Defense. The request was based entirely on the increased volunteer rate and does not represent a reduction in requirement for medical officers. Whether or not all of the doctors whose induction will be delayed during August will be called during September is dependent on the volunteer rate during the next few weeks. No reduction is anticipated for the call of 152 Priority I doctors scheduled to be inducted during September.

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[1] Released by the Office of the Surgeon General, Department of the Army, in cooperation with the Public Health Service; the Bureau of Medicine and Surgery, Department of the Navy; and the Office of the Surgeon General, Department of the Air Force.

FOREIGN LETTERS

SWEDEN

Blood Transfusion Service in Wartime.—At a meeting in April, 1951, devoted to a discussion of wartime problems, Dr. B. Vahlquist of Uppsala and Dr. O. Wilander of Ørebro dealt with the preparations for providing Sweden with a blood transfusion service capable of meeting wartime casualties. Some of their observations were based on experiences abroad. The French, for example, have calculated as the result of experiences in World War II that some 40 L. of blood must be provided for every hundred combatants. In 1949 there were some 30,000 blood donors available in Sweden, or 0.4% of the population. This is a much lower rate than that which existed in England in 1941, when there were some 900,000 donors available. Yet even the English did not have an overabundance of donors. What makes the situation worse, more than half the Swedish donors are at the present time men liable to be called into military service.

In recent months the Swedish Red Cross, in conjunction with the Swedish Army Medical Service, has conducted a campaign for recruiting donors in the county of Uppsala. Special attention has been paid to prospective donors among women between the ages of 18 and 50. Some 1,850 persons have been medically examined and tested for blood grouping. Among them were some 250 Rh-negative persons. Though this campaign was conducted with civil defense in view, results should prove of great value also in time of peace. The Swedish military authorities have organized the wartime blood transfusion centers so that about one-third of them are mobile, ready to take up work at new centers or to supplement stationary centers with personnel and equipment. It is realized that, in an emergency and when the blood supply is inadequate, it may be necessary to resort to substitutes, such as plasma and gelatin or saline solutions. It may also be necessary to relax some of the precautionary measures taken in peacetime. The suggestion that blood transfusion services should deal only with O-donors as universal donors has not found favor, as it would reduce the total number of donors by about 50%. Even in an emergency, particularly in wartime, one should not dispense with testing blood for syphilis.

Swedish Diabetes Association.—Ever since the successful application of the discovery of insulin, diabetics have increased in such numbers that effective cooperation among them has been called for with growing insistence. The local associations of diabetics established several years ago have combined in a central organization devoted to their interests. In 1943, an official investigation of diabetes in Sweden was started; in the autumn of 1948, this investigation culminated in a report in which a careful analysis of the diabetes situation formed the basis of certain definite plans for the future. In the autumn of 1949, the various diabetes associations were fused into the central Swedish Diabetes Association, charged with the task of research and treatment. Approximately half the members of the governing body of this association are doctors; among them were two, Prof. Hjalmar Holmgren and Dr. John Byttner, who recently died. These two deaths meant a serious loss to the association, for Prof. Holmgren was engaged on important research into disturbances of carbohydrate metabolism and the rhythmic activities of the liver with special reference to diabetes, and Dr. Byttner had taken an active part in the commission of inquiry between 1943 and 1948. He was engaged, at the time of his death, on plans for a special diabetes hospital, a center for research, teaching, and treatment.

These plans have now materialized in the conversion of a small private hospital into a center of research and treatment administered by the association. This center (Frejgatan 32, Stockholm) will begin with 16 beds for diabetics and will be in charge of Dr. Jakob Möllerström, who worked for many years with Prof. Holmgren. The clinical material available at this center will be closely studied with reference to such problems as those related to the so-called tertiary stage of diabetes, i. e., the changes to be observed in the eyes, kidneys, and vascular and nervous systems in diabetes of long standing. Doctors throughout Sweden have been invited to make use of and support this center.

Experiences of the Swedish Red Cross Hospital in Korea.—The Swedish Red Cross Hospital Unit which went to Korea in the fall of 1950, and which was stationed at Pusan, gained much valuable experience during the winter of 1950-1951. In a recent lecture in Stockholm about these experiences, Dr. G. Rundberg gave an account of the many precautions taken to combat all the evils of modern warfare in an uncivilized country. The members of the unit were inoculated against smallpox, typhus, typhoid, paratyphoid, cholera, tetanus, influenza, and, in a few cases, yellow fever. Inoculation with tetanus toxoid was so effective that no case of tetanus was observed among the United Nations' troops, whereas there were several such cases among the wounded prisoners of war admitted to the Swedish Hospital. The mortality was alarmingly high, despite treatment. Only one case of smallpox was admitted to hospital; it did not give rise to any secondary cases, presumably because of the immunity of the contacts. Up to February, 1951, there were 34 cases of typhus in a camp in which there were some 110,000 prisoners of war, but only in a few of these cases did the infection begin after admission to the camp. Though inoculation against typhus must not be under-rated, the most effective method of treating it seemed to be breaking the infection cycle by killing lice. Some seven tons of DDT were used as a spray every week.

Malaria caused by Plasmodium vivax was diagnosed in three cases in the hospital. Chloroquine phosphate appeared to be superior to quinacrine hydrochloride with regard to treatment and prophylaxis. As a prophylactic, chloroquine was given in tablet form only once a week. Many of the North Koreans treated in the hospital harbored ascarides. Dr. Rundberg stated that his American colleagues in a prisoner of war hospital had come to the conclusion that 90 to 100% of the North Koreans harbor these worms. The hospital was spared cases of rabies and plague, but the arrival of the latter was feared when the Chinese joined the North Koreans. During January and February, the venereal disease rate was high, with some 200 to 250 new cases daily. Prostitution being regarded as a legitimate occupation in Korea, and the number of prostitutes in Pusan alone being estimated at between 7,000 and 10,000, provision had to be made for care of the prostitutes as well as their clients

Death of Dr. Gunnar Nilson.—Dr. Gunnar Nilson was born on Sept. 28, 1872, in Uppsala, and died on March 28, 1951. He had for long been a striking figurehead in the Swedish medical world. The son of Prof. Lars Fredrik Nilson, he was educated in Uppsala and Stockholm, qualifying as a doctor in 1895 in the former town. He took his degree of doctor of medicine at the University of Lund in 1911, his subject being varicocele and its operative treatment. As early as 1898, he was attached to the Swedish Navy; in 1917, he was put at the head of the Swedish Naval Medical Service. He held this appointment till 1937, when he reached the age limit and retired. During the more than 20 years he was at the head of this service, Nilson's initiative and driving force were largely responsible for the reforms introduced. He was a clever and careful operator, and a good organizer and administrator. His personality was forceful, and he combined with it irresistible charm. With his patrician features and bearing, and because of the similarity of his name to that of England's great naval hero, he came to be known with affectionate jocularity by his colleagues as "The Sea Lord." He became a member of the Swedish Medical Society in 1900. From 1919 to 1940 he acted as secretary of the society as well as editor for its transactions. Much of his literary work was concerned with the history of medicine; in 1945, he published a volume on "Famous Swedish Doctors." In 1947, he published the "History of the Swedish Medical Society from 1908 to 1938." His latter years were disturbed by frequent small cerebral hemorrhages.

The items in these letters are contributed by regular correspondents in the various foreign countries.

SPAIN

Public Health Meeting.—The third Public Health Meeting was held in Madrid in April, 1951. The first and second meetings were held in 1943 and 1947, respectively. Dr. A. Crespo Alvarez and collaborators spoke on the use of antibiotics in sanitary campaigns, P. González and collaborators on modern trends in public health, and G. Clavero on virus diseases. Prof. G. Ramon (Paris) lectured on vaccination against diphtheria with diphtheritic antitoxin and vaccination against tetanus and associated vaccinations. Prof. Vogel (Hamburg) lectured on immunity in bilharziasis.

International Urology Forum.—The third international forum of urologic lectures was recently held at the urologic clinic of the Faculty of Medicine of the University of Madrid. Prof. A. de la Peña is the director of the clinic. Lectures were given by Dr. F. Orts Llorca, Faculty of Medicine of Cádiz; Drs. Sanz Ibañez, J. M. Corrales, Gay Prieto, and Vallejo Najera, Faculty of Medicine of Madrid; Dr. L. Caporale, Faculty of Medicine of Turin; Dr. D. Band, University of Edinburgh; Dr. C. de Moura, Faculty of Medicine of Lisbon, and Dr. V. Carulla, Faculty of Medicine of Barcelona.

For the first time since World War II, a group of internationally known professors of urology of faculties of medicine of Homburg-Sear, Diesseldorf, Erlanger, Koeln-Merheim, and Aschen have come to the Faculty of Medicine of Madrid, thus reestablishing cordial relations between German and Spanish urologists. They came to Spain on the invitation issued to the German Society of Urology. Dr. Boeminghaus, president of the German society, headed the group. Their lectures were as follows: Prof. Alken, renal vasography; Prof. Boeminghaus, trans-sacral cystectomy; Prof. Heuschi, chemotherapy of cancer of the urinary bladder; Prof. Tiermann, trans-sacral resection of hypogastric nerves, and Prof. Koch, lithogenesis and renal crisis.

Personals.—Dr. F. Grande Covián, having passed the examination, was recently appointed to the chair of physiology of the Faculty of Medicine of Zaragoza. Dr. Grande Covián collaborated with Prof. P. Hoffmann in Freiburg in 1929 on work on the physiology of the spinal reflexes. Later, he worked with Prof. S. Ochoa and Prof. J. Negrin in the Faculty of Medicine of Madrid on muscle chemistry. In 1932 and 1933, he worked in Copenhagen with Prof. Krogh on physiology of muscular exercise. In 1933, he worked in Lund with Prof. Thunberg on dehydrogenases of fatty acids. In 1934, he worked at the University College of London with Prof. L. Evans on metabolism of the heart. From 1936 to 1939, during the civil war in Spain, he was the assistant director of the Institute of Nutrition. He studied diseases of nutrition and the role of nicotinic acid in the prevention of pellagra. He found that pellagra may develop even in persons ingesting sufficient nicotinic acid. He proved that the neurologic symptoms are independent of other symptoms that appear in patients with pellagra and pointed out that the neurologic changes are not due to a deficiency in vitamin B_1. In 1941, he started a study on nutrition in Madrid for the Rockefeller Foundation, with emphasis on the effects of poor nutrition on physical development of children. From 1942 to 1944, he studied the vitamin content of Spanish food and the intermediary metabolism of carbohydrates. From 1944 to 1949, he conducted a large number of experiments on alloxan diabetes. In 1949, he was invited to work in the biochemistry laboratory of the Neuropsychiatric Research Center in Cardiff with Prof. Richter with a scholarship from the British Council for studies on the interchange of phosphorus in nerves and the use of chromatography in studying the metabolism of amino acids in the brain. Dr. F. Grande Covián is a member of the Physiological Society, the Biochemical Society, and the Nutrition Society of England, of the Danske Biologiske Selskabet of Copenhagen, and of the Sociedad Portuguesa de Biologia. He has been a constant collaborator of Prof. C. Jiménez Diaz, director of the Instituto de Investigaciones Médicas.

Dr. L. Cifuentes Delatte successfully completed an examination for the chair of urology in the Hospital de la Princesa in Madrid. Dr. Cifuentes Delatte was a disciple of his father, Prof. P. Cifuentes Díaz and of Prof. C. Jiménez Díaz of Madrid. In 1933, he worked in Berlin with Prof. A. V. Lichtenberg. In 1946, he studied transureteral resection in the United States under Prof. Nesbit of Michigan and Alcock and Flocks of Iowa. His article on epithelium of vaginal type in the female trigone was published in America. The existence of these islands of vaginal epithelium was confirmed by Hedberg of Sweden and by Vokaer of Belgium. He wrote a book on "Cystitis and Cystopathies."

MEXICO

Macrocytic Anemias.—During the last five years, the Hospital de Enfermedades de la Nutrición undertook the study and classification of macrocytic anemias, according to the observations made in patients from regions corresponding to the Mexican plateau (altitudes ranging between 1,600 and 2,200 meters above sea level). It was learned previously, in the same institution, that the mean corpuscular volume in normal subjects living in those areas is 80 to 105 cubic microns, which is 10 cubic microns more than values in the United States. This phenomenon was called physiological macrocytosis of the altitudes, as differentiated from the physiological polycythemia of altitudes, rarely found in Mexico.

The results obtained emphasize several facts:

1. Not a single case of pernicious anemia was found in Mexican patients, regardless of the length of the period of observation and despite the hospital's being an institution in which there is some concentration of hematological cases. Of two patients in whom the existence of pernicious anemia was suspected, one did not return to the hospital and in the other the final diagnosis was nutritional macrocytic anemia.

2. In a group of 70 patients with severe malnutrition, due exclusively to dietary deficiency, 40 had macrocytic anemia, which showed the clinical form of nutritional macrocytic anemia in 26 cases; in the other 14 the clinical picture was one of sprue. The criteria for considering one case as sprue, and not as nutritional macrocytic anemia, were based on the existence, besides the anemia, of severe diarrhea with steatorrhea, abdominal distention, flat curve of the oral glucose tolerance test, and hypocalcemia.

Achlorhydria was found in 55% of the sprue cases and in 50% of the nutritional macrocytic anemia series. Neurological alterations, which often were severe (subacute combined degeneration was observed several times), were characteristic of the nutritional macrocytic anemia patients, and absent in the sprue group.

The best therapeutic results in the macrocytic anemia patients were obtained with purified liver extracts and with vitamin B_{12}, which is at variance with the observations of other investigators.

3. In 27 cases of anemia of pregnancy, there was only one with macrocytic anemia.

4. Although anemia was frequent in a series of 111 patients with proved liver cirrhosis (an incidence of 62%), in only seven of them was it macrocytic; nutritional deficiency was accepted as the cause.

5. There were no cases of macrocytic anemia in which the disease was due to hypothyroidism or to Diphyllobothrium latum.

Poliomyelitis in Mexico City.—Until 1945, poliomyelitis was uncommon in Mexico. Since then, its incidence has been increasing; in 1950, nearly a thousand cases were observed in Mexico City (incidence in lesser cities and in the country has been lower), and the figures for the first half of 1951 seem to be higher. Several explanations have been offered for this epidemiological phenomenon, none of them absolutely satisfactory.

Poliomyelitis in Mexico City has certain peculiarities worth mentioning: 1. It occurs predominantly in children under 5 years of age. 2. The death rate has been low so far—no more than 5%. Nevertheless, in this year this proportion seems to have increased also. 3. Paralysis appears only in 15% of the cases and generally is not too severe or extensive. 4. Seasonal incidence, which parallels the warmer months, is strictly related to climatic conditions. In Mexico City, the outbreaks of the disease occurred in March or April. Federal authorities have adopted all necessary and known measures, and two weeks ago a committee with representatives of the health department, of the municipal government, and of the education ministry was created to study the implications and consequences of this disease.

CORRESPONDENCE

POLIOMYELITIS

To the Editor:—With reference to an article on "Second Attacks of Poliomyelitis" by Archibald L. Hoyne and Irving Lipton, published in The Journal of the American Medical Association of June 23, 1951, I wish to call your attention to an article published by me on poliomyelitis in *California and Western Medicine,* June, 1946. This publication was the official publication of the California Medical Association on that date.

Drs. Hoyne and Lipton state in their summary, "It is probable that this is the only reported authentic second attack with fatal outcome." Perhaps the authors of this article did not completely review the literature, but I believe that the evidence presented in my article in *California and Western Medicine,* which is enclosed, leaves little doubt that this was also a second attack of poliomyelitis with fatal outcome. I am sure that this opinion was concurred in by Dr. Harold L. Faber, who was then chief of the division of pediatrics at Stanford Medical School. In the interest of scientific accuracy, I believe that The Journal might be interested in discovering that other second attacks that were fatal have occurred.

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HYSTERIA

To the Editor:—In the article by Drs. Purtell, Robins, and Cohen (*J.A.M.A.* **146:**902 [July 7] 1951) the point is well made that "hysteria" can be suspected clinically with as much accuracy as "organic" disease. However, I feel that the name used, "hysteria," is archaic and had best be abandoned, for the following reasons: 1. It has no precise definition in either medical or lay usage. 2. It is not a disease entity, nor can it be called a syndrome. 3. Its derivation (uterus) is misleading. 4. Other terms in current usage give a better picture of the mechanisms involved.

Psychiatric literature suffers from a confusion and profusion of terms; by its very antiquity, "hysteria" is a prime example of this.

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MORE ABOUT CLOTTING IN BIBLICAL LITERATURE

To the Editor:—Dr. Cyril E. Bousfield's comment on page 1152 of The Journal for July 21 requires further comment. Where is the evidence that Jesus was dead when speared? His companions' legs were broken—a custom based on experience to keep the crucified from reviving and walking away. A spear was thrust into His side to make sure He was dead. The fact that blood came when the skin was punctured makes it likely that He was alive. The "water" is another thing entirely. Even a small amount of blood mixed with it at any time prior to the deep puncture wound would have given the appearance of blood; hence the word water would not have been used. One must conclude that an effusion was tapped, either pericardial or pleural.

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INFORMATION ON BITES FROM REPTILES AND INSECTS

To the Editor:—I have been endeavoring to obtain statistical data on the types of poisonous reptiles and insects in the various states together with the number of persons bitten each year and the number of deaths. I am having somewhat of a difficult time because practically all states do not require reports of bites or stings of poisonous reptiles or insects. State boards of health have been very kind in replying to a questionnaire giving such meager information as they have.

I have come to the conclusion that the only way I can really get much information on the subject is by contact with medical men. Since it is impossible to write each doctor and to bear the expense of correspondence, it has seemed to me that The Journal of the American Medical Association might serve as a medium for obtaining that information. The statistical data required are as follows: 1. Number of persons treated in 1950 for poisonous reptile and insect bites (list kind of reptile or insect). 2. Number of persons treated in 1949 for poisonous reptile and insect bites (list kind of reptile or insect). 3. Number of deaths.

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MEDICAL MOTION PICTURES

The Stowaway: 16 mm., black and white, sound. Part I, Disease and Personal Hygiene (TF 8-1501), 17 min. Part II, Galley Sanitation (TF 8-1502), 24 min. Part III, Food Storage (TF 8-1503), 12 min. Produced in 1949 by the U. S. Army. Procurable on loan from Army Surgeon of Army Area in which the request originates, or on purchase from United World Films, Inc., 1445 Park Ave., New York 29.

Part I, Disease and Personal Hygiene, reveals both obvious and obscure ways in which disease is spread by food-handling personnel and clearly illustrates proper sanitary precautions and remedies. The methods shown in this film will help eliminate the spread of disease caused by careless personal hygiene of food handlers.

Part II, Galley Sanitation, presents methods of sanitation observed in a ship's galley as an illustration of how food service organizations should exercise every precaution to insure all sanitary measures in preventing the spread of disease.

Part III, Food Storage, covers the careful inspection of food by the U. S. Army Veterinary Corps, the Bureau of Animal Industry and the Port Food Service Inspector prior to procurement and use aboard troop transports. It shows in detail the proper facilities for food storage and the principles used for the proper storage and preservation of food.

Part I approaches the problems of causes of contamination negatively, showing how all the rules of hygiene can be and are broken. Parts II and III are "how to do it" films in which the teaching is accomplished by positive methods. They provide motivation by the use of excellent, clearly illustrated examples of why and how to store food properly. Repetition is used very effectively as a teaching method. Although these films are primarily concerned with the training of food handlers on troop transport ships, the lessons taught are applicable to other situations. These films are highly recommended for the beginning and in-service training of all personnel engaged in or planning to engage in food handling; however, certain aspects of Part I limit its use to male audiences. The photography and sound are excellent.

Surgical Anatomy of the Inguinal Area: 16 mm., color, silent, showing time 29 min. Prepared by *Conrad J. Baumgartner, M.D., and De Vere W. McGuffin, M.D.* Produced in 1947 by Department of Visual Education, College of Medical Evangelists, 312 N. Boyle Ave., Los Angeles 33. Procurable on loan from *Davis & Geck, Inc.,* 57 Willoughby St., Brooklyn 1.

This film shows the anatomy encountered in the repair of an inguinal hernia with particular attention to the transversalis fascia and Cooper's ligament. The dissection is performed on a fresh cadaver. The anatomy of the inguinal region is unusually well presented. The relation of the transversalis fascia to the femoral sheath and the location of Cooper's ligament are beautifully demonstrated. The anatomic structures used in the repair of the inguinal hernia are much better shown than on most films on the technic of inguinal hernia repair. The film is well captioned. This is an excellent teaching film and could be recommended for use in the teaching of anatomy to first year medical students as well as for the teaching of the technic of hernia repair to third and fourth year medical students. It would also be applicable for the teaching of interns, residents, and surgeons.

BUREAU OF LEGAL MEDICINE AND LEGISLATION

MEDICOLEGAL ABSTRACTS

Prenatal Injury: Liability for Stillbirth Following Motor Bus Accident.—The plaintiff and her husband filed suit for damages alleged to have resulted from injuries sustained by the plaintiff in a motor bus accident. From a judgment for the plaintiff, the defendant appealed to the court of appeal of Louisiana.

The motor bus, which was owned and operated by the defendant corporation, was driven into a ditch and the driver attempted to extricate it before allowing the passengers to alight. Although, in certain parts of the record, it is contended that the plaintiff was thrown to the floor of the bus, this did not occur; she caught herself on the seat ahead of her and received, as a matter of fact, only a slight jolt. At the time of the accident, however, the plaintiff was two to four months pregnant and about five and one-half months later the child with which she had been pregnant was born dead.

The major item of loss claimed by the plaintiff was based on the fact that the expected child was born dead, and the defendants contended that for such an item of loss or damage there can be no recovery, as a matter of law, regardless of the cause.

The defendant directed the court's attention to Article 28 of the Civil Code providing: "Children born dead are considered as if they had never been born or conceived." The defendants argued that since a child born dead is considered as never having been conceived, it must be concluded that nothing has been lost since there can be no loss of anything that has never existed. We can not be persuaded, said the court, that there are no circumstances under which damages should be awarded to the parents of the unborn child if the foetus, while in its mother's womb, has been so injured that it cannot be borne alive. We are certain that the redactors of our code had no such purpose in mind in enacting Article 28.

The court was referred to a discussion on the subject of "Tort Liability for Prenatal Injury" in 24 T. L. R. at page 435. The author of that article says that as a general rule "there can be no recovery for the loss of the society and prospective earnings of the child." There could, however, be a recovery for a result of an accident which might cause sterility, or which might otherwise prevent parents from having children, said the court. If, as the result of actionable negligence, a husband or wife should be so injured that either, in the future, could not expect to produce children, surely this would be taken into consideration as an item of damage. It necessarily follows that when parents are actually expecting arrival of a child, and are deprived of the fruition of that great expectation by someone's actionable negligence, they may recover from the tortfeasor for that particular loss. In the article above referred to, the author also says "although mental anguish based specifically upon the loss or death of the child is not recoverable, recovery has been allowed for the mother's mental anguish if the child is born malformed." If the mother may recover for the mental anguish caused by the fact that the child has been born malformed, said the court, it is surely illogical to hold that, under the same circumstances, the mother cannot recover where, as the result of negligence, the child is prevented from coming into existence at all. In the same article the author states that, where there is an injury to a pregnant woman "there may be recovery for the fear that harm may have resulted to the child." If this is true, surely it should follow that if that fear is realized and the child is stillborn, there should be allowed recovery for the stillbirth of the child. As a matter of fact, said the court, the author of the article concludes with a statement that, in all such cases in which it is contended that some accident has caused prenatal injuries, "the evidence to prove causal relationship should be subjected to the strictest examination." And that is our conclusion here, said the court of appeals, that as a matter of law, there may be recovery by the parents where there is actionable negligence which causes such injury to a viable foetus as to prevent its being born alive, but that there must be strict proof that the actionable negligence was the cause of the unfortunate occurrence.

The court next considered whether or not the plaintiffs introduced sufficient evidence to indicate that the stillbirth was caused by the accident. The plaintiff contended that the accident made it necessary for the plaintiff to remain in bed for a large part of the time, that she remained inactive and took no exercise, and that as a result her weight became very excessive, with the secondary result that the weight of the viable foetus became also excessive and that, as a consequence, the foetus itself grew so large that it could not be born alive. Dr. LaRocca, the attending physician, did not attribute the stillbirth directly to the accident. He said: "I did not say the trauma caused the death. I said that the oversize of the baby, and the abnormal circumstances of her pregnancy, were the cause of the death of the baby." He explained that what he meant by "abnormal" condition of her pregnancy, was the fact that the plaintiff was confined to her bed for long periods, with the result that she and the baby grew to abnormal proportions. We are of the opinion, said the court, that the overwhelming weight of medical testimony is to the effect that these factors had nothing to do with the somewhat abnormal development of the foetus. The testimony of a number of doctors indicates that no matter how much an expectant mother may eat, the foetus absorbs only so much as nature requires, and that its size does not depend at all on the quantity of food taken by the mother. These doctors also stated that the fact that the mother is required to remain in bed for several hours each day and that she is permitted to take little or no exercise does not affect the size of the foetus.

We conclude, as we have stated, that the abnormal size of the foetus was not the result of the fact that the mother herself was tremendously overweight and that she was required to remain inactive for several hours each day. In reaching this conclusion, the court continued, we have not been able to lose sight of the fact that the record strongly suggests another cause for the abnormal size of the unborn foetus. All of the doctors agree that diabetes of a mother is almost always the cause of abnormal growth of the foetus. While Dr. LaRocca stated that the plaintiff did not have true diabetes, he conceded that she had what he said was "transitory" diabetes, and the diet which he required for her was one which is recognized for diabetes. He says, too, that he took into consideration the fact that the plaintiff was much overweight and that she was confined to her bed for long periods and prescribed a diet accordingly, and he very significantly added, "If she had lived up to it her weight would have been reduced." The medical experts who testified on behalf of the defendants stated that they did not know of such disease as transitory diabetes but there can be no doubt that the overwhelming medical testimony shows conclusively that the percentage of abortions and stillbirths among diabetic women is tremendously greater than among women not so affected.

Even if it could be conceded that the size of the baby was not the result of the mother's tendency to diabetes and was not the result of the extreme overweight of the mother or of her long periods of rest, still there is no proof whatever that its size was the cause of its being stillborn. Dr. LaRocca knew of its size. He had made all necessary examinations of the mother and at the time he knew of nothing which would have prevented her from giving normal birth to a child even of that size. We cannot say how much significance should be attached to it, but we have not been able to lose sight of the fact that although the plaintiff had given birth to her first child, which was still living, she had, some five years before the present occurrence, given birth to another stillborn child, thus possibly indicating a tendency which may have been felt at this time.

Our conclusion is that at most all that can be said is that there was a sequence of events which may have led a layman to feel that the stillbirth was the result of the accident, but that the overwhelming medical testimony makes it impossible that we accept that conclusion and we have decided that no allowance should be made for the fact that the child was not born alive.

The court therefore held that the parents had a right to maintain an action for damages for the stillbirth but that they failed to prove that the stillbirth was caused by the accident. Other items of damages were, however, awarded, and the judgment in favor of the plaintiff was affirmed.—*Valence v. Louisiana Power & Light Co., 50 So. (2d) 847 (Louisiana, 1951).*

MEDICAL LITERATURE ABSTRACTS

AMERICAN

A.M.A. Arch. Indust. Hyg. & Occup. Med., Chicago

3:445-542 (May) 1951

Fatalities from Hydrogen Sulfide in Wells. J. M. McDonald and A. P. McIntosh.—p. 445.

Toxicological Study of Some Polypropylene (Polyoxypropylene) Glycols. C. B. Shaffer, C. P. Carpenter, F. H. Critchfield and others.—p. 448.

Aiding Cardiac Patient in Industry. E. M. Kline.—p. 454.

Air Flow Measurements on Human Subjects With and Without Respiratory Resistance at Several Work Rates. L. Silverman, G. Lee, T. Plotkin and others.—p. 461.

Chronic Toxicity of Methylpolysiloxane "DC Antifoam® A" In Dogs. G. P. Child, H. O. Paquin Jr. and W. B. Deichmann.—p. 479.

Activities of State and Local Agencies in Industrial Health. V. M. Trasko.—p. 483.

Cadmium Poisoning. L. H. Cotter and B. H. Cotter.—p. 495.

Investigation of Small, Airborne, Charged Particles by Electrical Method. J. H. Daniel and F. S. Brackett.—p. 505.

3:543-648 (June) 1951

SYMPOSIUM ON TREATMENT OF CHRONIC BERYLLIUM POISONING WITH ACTH AND CORTISONE

Chronic Pulmonary Interstitial Granulomatosis: Preliminary Report on Two Patients Treated with ACTH. J. M. De Nardi.—p. 543.

Case of Chronic Beryllium Poisoning from Atomic Energy Development. R. J. Hasterlik.—p. 547.

Five Cases from Fluorescent Lamp Industry: Treatment of Chronic Beryllium Poisoning with ACTH and Cortisone. E. M. Kline, S. R. Inkley and W. H. Pritchard.—p. 549.

Chronic Berylliosis in Neon Sign Industry. O. A. Sander.—p. 565.

*Spontaneous Remission of Chronic Berryllium Posioning from Fluorescent Lamp Manufacturing: Report of Case. J. W. Cass Jr.—p. 569.

Chronic Beryllium Poisoning of Long Duration from Fluorescent Lamp Manufacturing: Report of Case. G. K. Fenn.—p. 571.

Beryllium Disease from the Ceramic Industry: Report of Case. P. W. Reynolds.—p. 575.

Metabolic Study of Case of Chronic Beryllium Poisoning Treated with ACTH. H. L. Hardy, F. C. Bartter and A. E. Jaffin.—p. 579.

Choice of Drugs and Dosage. H. S. Van Ordstrand.—p. 583.

Recognition and Prevention of Complications of ACTH and Cortisone Therapy. T. F. Frawley.—p. 587.

Information Gained in Pretherapy and Post-Therapy Pulmonary Function Studies. J. McClement.—p. 599.

Pulmonary Function in Patients with Pulmonary Disease Treated with ACTH. B. G. Ferris Jr., J. E. Affeldt, H. A. Kriete and J. L. Whittenberger.—p. 603.

Interpretation of Results of ACTH and Cortisone Therapy in Chronic Beryllium Poisoning: Data Obtained by Pretherapy and Post-Therapy Studies of Pulmonary Function. G. W. Wright.—p. 617.

Minimum Observations Necessary to Advance Knowledge of Action of ACTH and Cortisone. A. Forbes.—p. 622.

Current Research Problems Concerning Pulmonary Granulomatosis in Beryllium Workers. F. Klemperer.—p. 625.

Spontaneous Remission of Chronic Beryllium Poisoning.—Cass describes the case of a man who, in January, 1943, complained of shortness of breath, loss of weight, and general weakness. Roentgenograms of the chest led to a questionable diagnosis of sarcoid, but further inquiry revealed that in 1941 the man had worked in a fluorescent lamp factory. Later it was recognized that this man had a syndrome similar to that found in several other employees of this company and that it was probably beryllium poisoning. The patient remained disabled and acutely ill for six or seven months. Finally he began to improve. At the end of eight months he was well enough to go back to part-time work, and about one year after the onset of the illness he was able to return to full-time work. Roentgenograms of the chest still show diffuse granulomatous lesions, but the individual nodules seem smaller and more dense than formerly. Small stones were passed during several episodes of acute renal colic, and their analysis revealed beryllium, but the last time stones were passed, they showed no evidence of beryllium. The patient received medical supervision but no specific therapy. The author doubts that either corticotrophin (ACTH) or cortisone should be used for this disease over long periods as has been suggested by some. He feels that as adjuncts to other symptomatic therapy during the phase of prostration and debility, as a means of producing general systemic stimulation, their use may be justified, but there is little justification for using them simply because the roentgenograms show improvement of the pulmonary lesions. In fact, this may be a disadvantage, for the removal of the protective band of lymphocytes from the beryllium particles may result in an undesired freeing of beryllium.

A.M.A. Arch. Otolaryngology, Chicago

53:483-606 (May) 1951

Distribution and Comparison of Nasal Cilia. G. E. Tremble.—p. 483.

Uncommon Conditions in Field of Otolaryngology Seen in Office Practice. J. C. Peele.—p. 492.

*Is Hearing Loss Due to Nutritional Deficiency? Further Studies on Influence of Vitamin A in Certain Types of Impaired Hearing. M. J. Lobel.—p. 515.

Secondary Tonsillar and Adenoid Hemorrhage in Relation to Barometric Pressure Changes. S. J. Pearlman and A. Loewy.—p. 527.

Treatment of Complete Unilateral Bony Atresia of Posterior Nares: New Technique and Brief Reference to Asphyxia Neonatorum. H. H. Beinfield.—p. 530.

Allergy: Summaries of Bibliographic Material Available in Field of Otolaryngology for 1949. E. L. MacQuiddy and E. A. Holyoke. —p. 560.

Hearing Loss and Nutritional Deficiency.—Lobel cites several investigations on the value of an injectable vitamin A preparation in otosclerosis and other types of impaired hearing not amenable to the usual otolaryngologic methods of treatment, and then describes patients with hearing loss who have been treated primarily with vitamin A and other measures. He concludes that the present clinical study, like some previous ones, indicates that vitamin deficiency and hearing loss are in some manner related. Results of clinical trials with an injectable vitamin A preparation hold promise of its therapeutic value in certain types of deafness. Despite the fact that in some instances the hearing loss was not influenced, the accompanying tinnitus was greatly relieved. Further trials with vitamin A, alone or combined with other vitamins, seem definitely warranted.

American Journal of Hygiene, Baltimore

53:237-358 (May) 1951. **Partial Index**

In Vitro Sensitivity Tests with Eight Antibiotics Against Escherichia Coli 111, B_4, Special Type of Coliform Bacillus Associated with Infant Diarrhea. W. W. Ferguson, J. C. Jennings and R. Y. Gottshall. —p. 237.

Exoerythrocytic Schizogony in Plasmodium Hexamerium. R. D. Manwell.—p. 244.

Japanese B Encephalitis Virus in Blood of Experimentally Inoculated Birds: Epidemiological Implications. W. M. Hammon, W. C. Reeves and G. E. Sather.—p. 249.

Study of Association of Factors of Pregnancy and Parturition with Development of Cerebral Palsy: Preliminary Report. A. M. Lilienfeld and E. Parkhurst.—p. 262.

Antigenicity of Single, Graded Doses of Purified Diphtheria Toxoid in Man. G. Edsall, H. J. Banton and R. E. Wheeler.—p. 283.

Immunological Relationships Among Species and Strains of Virulent Treponemes as Determined with Treponemal Immobilization Test. A. S. Khan, R. A. Nelson Jr. and T. B. Turner.—p. 296.

Immunization Against Scrub Typhus: I. Combined Living Vaccine and Chemoprophylaxis in Volunteers. J. E. Smadel, H. L. Ley Jr., F. H. Diercks and others.—p. 317.

Complement-Fixation Tests for Murine Typhus on Sera of Wild-Caught Cotton Rats in Florida. E. R. Rickard and C. B. Worth.—p. 332.

Role of Particle Size in Experimental Air-Borne Infection. L. S. Sonkin. —p. 337.

The Association library lends periodicals to members of the Association and to individual subscribers in Continental United States and Canada for a period of five days. Three journals may be borrowed at a time. Periodicals are available from 1940 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied with stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted.

American Journal of Medical Sciences, Philadelphia

221:479-598 (May) 1951

*Prevention of Degenerative Vascular Lesions in Young Patients by Control of Diabetes. J. L. Wilson, H. F. Root and A. Marble.—p. 479.
Incidence of Diabetic Retinopathy Relative to Degree of Diabetic Control. S. Spoont, W. W. Dyer, R. Day and H. Blazer.—p. 490.
Iatrogenic Hypothyroidism. F. T. Billings.—p. 495.
*Effect of Cortisone on Clinical Course of Chronic Regional Enteritis and Chronic Idiopathic Ulcerative Colitis. T. E. Machella and O. R. Hollan.—p. 501.
Myocardial Infarction: Study of Acute Phase in 920 Patients. F. J. Smith, J. W. Keyes and R. M. Denham.—p. 508.
Bronchiectasis: Study of 220 Proved Cases. T. H. Lorenz.—p. 522.
Toxic Effects of Varying Doses of Kerosene Administered by Different Routes. J. A. Richardson and H. R. Pratt-Thomas.—p. 531.
Satiety as Factor in Nutrition States: Observations on Mass Exchange. J. M. Strang.—p. 537.
Whipple's Intestinal Lipodystrophy: Its Relationship to Rheumatic State. J. C. Peterson and R. H. Kampmeier.—p. 543.
Evaluation of Artane and Tolserol in Treatment of Spastic Disorders. A. S. Effron and W. M. Schultz.—p. 561.
Recent Advances in Drug Therapy of Peptic Ulcer. J. E. Berk.—p. 567.
Roentgenologic Diagnosis of Congenital Cardiovascular Malformations. D. M. Gould.—p. 581.

Prevention of Degenerative Vascular Lesions in Diabetes Mellitus.—Studies were made of 247 patients with diabetes mellitus, 122 males and 125 females, with age of onset from 18 months to 30 yr. and with duration from 10 to 34 yr. Particular emphasis was given to the relationship between control of the diabetes mellitus and the development of degenerative lesions in the kidneys, retinas, and blood vessels. Ideal or perfect control of diabetes mellitus implies that a balanced diet has been so well utilized by an adequate insulin effect that blood and urine tests are invariably normal. When various degrees of control were plotted against the duration of diabetes and the development of calcified vessels, retinitis, and albuminuria, the following facts appeared: No patients with excellent or good control showed advanced calcification or pronounced retinitis even after periods of 20 to 34 yr. of diabetes mellitus. Diabetic nephropathy did not develop in patients with good or excellent control, even after periods of 20 to 34 yr., but did appear in 62 patients with poor or fair control, 13 of whom died during the year of this study. Four out of 103 patients with diabetes for periods of at least 20 yr. had excellent control. Three of these had no retinal lesions. Of 54 with moderate to pronounced retinitis, all but five had had fair or poor control and none had had excellent control. Of 80 patients who lived for periods of at least 20 yr. on an unmeasured diet without constant use of insulin and without constant control of glycosuria, 55 showed severe degenerative vascular lesions. Whatever the specific etiological factors causing diabetic degenerative lesions may be, it has been demonstrated that the regulation of diabetes mellitus controls these factors. Control of diabetes mellitus is thus more important than any known factor, such as duration or severity, in prevention of these degenerative complications.

Cortisone in Chronic Regional Enteritis and Chronic Ulcerative Colitis.—Three patients with chronic regional enteritis with or without involvement of the proximal colon and three patients with chronic ulcerative colitis were subjected to a therapeutic trial with cortisone. The drug was injected subcutaneously according to the following schedule: 100 mg. every eight hours for three doses, then 200 mg. every 12 hr. for two doses, and thereafter 50 mg. every 12 hr. for eight additional days. Moderate to pronounced remission of symptoms occurred in the three patients with regional enteritis and in two of the patients with ulcerative colitis. In the three patients with regional enteritis the improvement seemed to be definitely related to the cortisone; the evidence was less clear in the two patients with ulcerative colitis. In each of the five improved patients a relapse occurred within five to 73 days after cessation of treatment. The best responses were obtained in the two patients who had the lowest initial eosinophil counts. The patient with the highest eosinophil count showed no improvement. Two of the three patients who responded most dramatically were the most critically ill of the group, which suggests that the severity of the disease is one of the factors determining a good response. A trial of cortisone therapy would appear to be worth while in certain cases of regional enteritis or ulcerative colitis, particularly in critically ill patients when the situation is desperate and a long enough period of improvement is desired for the effective use of other therapeutic measures. Cortisone does not ensure cure of the disease, as a relapse may occur after administration of the drug is discontinued.

American Journal of Physiology, Baltimore

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Decrease of Cardiac Output by Acute Pericardial Effusion and Its Effect on Renal Hemodynamics and Electrolyte Excretion. R. S. Post.—p. 278.
Mechanism of Action of Vitamin P Flavonoid (Rutin) on Cutaneous Circulation. A. A. Schiller.—p. 293.
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Utilization of Intravenously Injected Radioactive Colloidal Iron in Rabbits with Myopathy of Vitamin E Deficiency. I. Indovina.—p. 352.
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Glomerular and Tubular Influences on Sodium and Water Excretion. C. B. Mueller, A. Surtshin, M. R. Carlin and H. L. White.—p. 411.
Action of Nor-Epinephrine and Adrenal Cortical Steroids on Blood Pressure and Work Performance of Adrenalectomized Dogs. E. R. Ramey, M. S. Goldstein and R. Levine.—p. 450.
Limitations of ACTH Regulating Effect of Corticoids. C. Fortier, S. Yrarrazaval and H. Selye.—p. 466.
Work Output and Blood Glucose Values in Severely Diabetic Rats With and Without Insulin. D. J. Ingle, J. E. Nezamis and E. H. Morley. —p. 469.
Effect of Testosterone Propionate on Red Cell Count in Ovariectomized and Ovariectomized-Thyroidectomized Rat. D. A. De Bias.—p. 476.
Remarkable Effectiveness of Small Daily Doses of Growth Hormone in Dogs. O. H. Gaebler, P. D. Bartlett and M. J. Sweeney.—p. 486.

American Journal of Psychotherapy, New York

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Nightmares of Cannibalism. N. Fodor.—p. 226.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

65:685-852 (May) 1951

Triumphs of Palliation in Radiation Therapy. B. P. Widmann.—p. 685.
*Growth and Spread of Cancer of Cervix Uteri. G. H. Twombly and S. di Palma.—p. 691.
Results of Surgical Treatment of Cancer of Cervix Uteri. J. V. Meigs. —p. 698.
Radiation Treatment of Cancer of Cervix Uteri. J. F. Nolan and L. Du Sault.—p. 709.
*End Results of Radiation Treatment of Cancer of Cervix Uteri. H. E. Schmitz.—p. 715.
Possibilities of Radical Surgery in Cancer of Cervix Uteri Recurrent After Radiation Therapy. A. Brunschwig.—p. 720.
Radiocobalt (Co^{60}) as Therapeutic Alternative to Radium. C. W. Wilson. —p. 726.
Individualized Interstitial Irradiation of Cancer of Uterine Cervix Using Cobalt 60 in Needles, Inserted Through Lucite Template: Progress Report. J. L. Morton, A. C. Barnes, G. W. Callendine Jr. and W. G. Myers.—p. 737.
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Pelvic and Extrapelvic Osteopathy in Rheumatoid Spondylitis: Clinical and Roentgenographic Study of 90 Cases. C. M. Guest and H. G. Jacobson.—p. 760.
Synovioma: With Special Reference to Clinical and Roentgenologic Aspects. D. E. Hale.—p. 769.
Appearance of Centers of Ossification in Human Pelvis Before Birth. C. C. Francis.—p. 778.
Growth of Shaft of Human Radius and Ulna During First Two Years of Life. M. K. Ghantus.—p. 784.
Dose Distribution Measurements with University of Illinois 25 Mev. Medical Betatron. J. S. Laughlin, J. W. Beattie, J. E. Lindsay and R. A. Harvey.—p. 787.
Practical Compression Device for Spot Roentgenograms. W. S. Tirman and A. C. Nickel.—p. 800.

Growth and Spread of Cancer of Cervix Uteri.—Cancer of the cervix uteri may begin as carcinoma in situ, a disease that has been detected in patients whose average age is eight to 12 years younger than that of women with infiltrative cancer of the cervix. If it can be shown that carcinoma in situ is the usual precursor of infiltrative cancer, these figures would suggest that there may be a prolonged period during which incipient cancer may be detected and treated with the prospect of close to 100% cure rate. On the contrary, untreated invasive cancer of the cervix is a rapidly fatal disease. Of 171 women with cancer of the cervix seen at the New York Cancer Institute between 1930 and 1949 who had not received surgical or irradiation treatment, 58% died within one year of the onset of symptoms and 82% within two years. Four and six-tenths per cent of the women with untreated cervical cancer survived five years. Radical hysterectomy was performed on 91 women with cancer of the cervix. Microscopic examination of the parametrial tissue outside the cervix showed invasion by cancer in about half the patients, proving that parametrial involvement occurs by direct extension fairly rapidly. Only 15 (16.5%) of these 91 patients showed lymph node metastases. The nodes in the obturator fossa were the sites of metastasis in nine patients, the lymph node lying in the bifurcation of the common iliac artery ("hypogastric node") in eight patients and in the common iliac nodes in four patients. Necropsy in patients who died of cancer of the cervix revealed metastatic disease outside the pelvis in only about 50%. The commonest sites of metastasis were the periaortic and retroperitoneal nodes, the liver, the lung, and the vertebral column. The commonest cause of death in cancer of cervix uteri is either ureteral obstruction or infection of the urinary tract associated with it. Operative relief of such obstruction is of doubtful value, unless there is some promising method of curing the primary tumor.

Irradiation Treatment of Cancer of the Cervix Uteri.—A questionnaire sent to the heads of the departments of gynecology of the 77 medical schools in the United States and Canada demonstrated that these physicians prefer irradiation treatment to surgical treatment of cervical cancer. This report shows the end results of a planned course of irradiation therapy in 188 patients with cervical carcinoma who had no previous treatment. They were given 50 mg. of radium element in tandem filtered by 2 mm. of brass and 3 mm. of para rubber for 1,500 mg. hr. every eight days in three applications for a total of 4,500 mg. hr. The radium dose administered to area A was 7,000 gamma roentgens and, to area B, 1,540 gamma roentgens. On the days the patient was not receiving radium therapy, she was given daily roentgen treatment to one field; 250 or 300 r was administered daily, and the total number of fields was regulated by the measurement of the patient. A total tumor dose of 3,500 to 4,000 r was given. Of the 188 patients, 43.6% are free of evidence of disease after five years. The complications associated with irradiation of the pelvis were not found to be frequent or severe enough to cause rejection of this method of therapy. The cell type of the disease in no way aided in prognostication. The response of the tumor to therapy and the extent of the disease definitely influenced the prognosis. It is therefore recognized that any pronounced progress in saving the life of patients with carcinoma of the cervix must be made through early detection of the lesion. There is no evidence that primary surgical treatment holds any advantage over irradiation therapy.

American Journal of Surgery, New York

81:371-480 (April) 1951

Salivary Tissue Neoplasms. J. W. Hendrick, G. E. Ward and M. M. Lacy.—p. 373.
Carcinoma of Prostate. W. Baurys.—p. 387.
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Evaluation of Extrapleural Pneumonolysis with Lucite Plombage: Preliminary Report. W. W. Buckingham, A. J. Beatty, C. A. Brasher and P. Ottosen.—p. 401.
Brachial Plexus Anesthesia: Comparative Study of Agents and Technics. W. M. Shaw and B. Root.—p. 407.
Scalenus Anticus Syndrome: Unusual Diagnostic and Therapeutic Aspects. W. D. Holden, J. A. Murphy and A. F. Portmann.—p. 411.
Effects of Local Alkaline Phosphatase in Experimentally Produced Fracture in Rabbit. E. D. Jones.—p. 417.
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Obstruction of Alimentary Tract from Gallstones. C. W. McLaughlin Jr. and M. Raines.—p. 424.
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Right Inguinal Hernia Following Appendectomy. M. E. Lichtenstein and I. M. Isoe.—p. 436.

American Journal of Tropical Medicine, Baltimore

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Camoquin in Treatment of Human Malaria. R. M. Mein.—p. 212.
Mel B in Treatment of Tryparsamide Resistant T. Gambiense Sleeping Sickness: Observations on Drug Resistance in Trypanosomes of the French Cameroun. E. A. H. Friedheim.—p. 218.
Chloromycetin in Experimental Trypanosoma Equiperdum Infection in Rats. O. M. Gruhzit and R. A. Fisken.—p. 236.
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Nomenclature of Eye Gnats (Hippelates Spp.). C. W. Sabrosky.—p. 257.
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Peripheral Arterial Embolism. J. R. Veal and T. J. Dugan.—p. 603.
*Thrombo-Embolism in Children: Analysis of 35 Cases. P. T. Decamp, A. Ochsner and M. DeBakey.—p. 611.
Cardiac Tamponade: Treatment by Aspiration. D. C. Elkin and R. E. Campbell.—p. 623.
Acute Appendicitis in Aging Negro. F. F. Boyce.—p. 631.
Total Intravenous Alimentation in Treatment of Small Bowel Fistulas. H. C. Hull and T. G. Barnes.—p. 644.
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Surgical Management of Diverticulitis of Colon. J. M. Donald.—p. 708.
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*Indications for Surgical Intervention in Ulcerative Colitis. F. H. Lahey.—p. 726.
One-Year to Four-Year Follow-Up Examinations of 130 Vagotomized Patients. W. Walters and H. H. Belding III.—p. 743.

Thromboembolism in Children.—During the 12-yr. period ending June 30, 1950, thromboembolism occurred in 35 children aged 12 or less who were admitted to a large general hospital. While the over-all incidence of thromboembolism is lower in children than in adults, a higher percentage of the cases in children are fatal. The age distribution of the fatal cases in children closely followed the age distribution of all fatalities in the hospital, the highest incidence occurring in early infancy. In contrast with thrombosis in adults, major precipitating factors are essential for thrombosis to develop in children. The newborn infant is particularly susceptible to such precipitating factors as infection, dehydration, malnutrition, and circulatory stasis. Nonseptic peripheral thrombosis was rarely observed in the children reported on. Visceral thrombosis was common and frequently contributed directly to a fatal outcome. Pulmonary embolism, thrombosis, or both, were frequently observed in younger and older children. Heart disease was a significant cause of thrombosis in older children. The incidence of thrombosis in children has diminished during the period of the author's study, while the adult incidence has doubled. This improvement resulted primarily because of the control of infections previously leading to venous thrombosis in children. The incidence should be further reduced as the principles and techniques of hydration, nutrition, and control of regional and systemic infections are applied more vigorously.

Surgical Intervention in Ulcerative Colitis.—Of 770 patients with ulcerative colitis treated at the Lahey Clinic, 308 required surgical therapy. Ileostomy was the procedure most frequently performed. Because of improvement in the medical and surgical management of these patients the mortality rate for this operation has been reduced from 18.6% to 2% since 1947. An important medical advance has been the use of corticotrophin (ACTH), which brought about a remission in 21 out of 28 patients in this series. This made it unnecessary to perform ileostomy and colectomy during the acute stage, when the mortality rate is high. Early ileostomy is justified in a patient in the acute stage of the disease when remission has not occurred promptly with corticotrophin. The performance of ileostomy and its management has been improved, so that complications such as skin erosion, prolapse, and retraction of ileostomy no longer occur. Bowel hemorrhage in the acute phase of the disease is another indication for prompt ileostomy. If colectomy then becomes urgently necessary because of failure to control the bleeding from the colon, it can be undertaken with the ileostomy already established and the fecal stream sidetracked. Ileostomy and partial resection of the colon combined in one operation may elevate the mortality rate unduly and should be done only in good risk patients by surgeons with experience in these cases, and even then with extreme caution. Acute perforation has not been a common complication in the author's experience. Chronic perforation was frequently associated with obstruction and with a walled-off abscess. All closures of perforations for ulcerative colitis should be combined with ileostomy. Involvement of the joints is a definite indication for prompt ileostomy, to be followed by total colectomy and abdominosacral removal of the rectum. The same applies to multiple anal fistulas that produce induration of the perineal tissues and resultant rigid anal sphincters. Colectomy is advised for all patients who have had a permanent ileostomy established.

Arkansas Medical Society Journal, Fort Smith

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48:1-42 (June) 1951

The American Academy of General Practice in Field of Organized Medicine. J. R. Bender.—p. 4.

Cancer Research, Chicago

11:297-392 (May) 1951. Partial Index

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Increased Weight and Mitotic Activity in Liver of Tumor-Bearing Rats and Mice. E. Annau, A. Manginelli and A. Roth.—p. 304.
Distribution of S^{35} from Labeled DL-Methionine in Mice Bearing Carcinoma of Breast, Neoplasms of Hematopoietic System, or Liver Abscesses. H. S. Bloch, C. R. Hitchcock and A. J. Kremen.—p. 313.
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Carbohydrate Metabolism of Brown-Pearce Carcinoma of Rabbit in Normal and Hypoglycemic Serum. R. H. Steckel and J. R. Murlin. —p. 330.
Development of Resistance to Reinoculation and Circulating Cytotoxins in Response to Heterologous Ocular Tumor Transplantation in Guinea Pig. A. C. Snell Jr. and B. V. Favata.—p. 335.
Systemic Effects of Tumors in Rats. R. W. Begg.—p. 341.
Histochemical and Microchemical Changes in Experimental Cirrhosis and Hepatoma Formation in Mice by Carbon Tetrachloride. R. E. Stowell, C. S. Lee, K. K. Tsuboi and A. Willasana.—p. 345.
Histological and Chemical Alterations Produced in Mouse Epidermis by Soft X-Radiation. M. H. Toosy.—p. 361.
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Electrophoretic and Ultracentrifugal Studies on Soluble Proteins of Various Tumors and of Livers from Rats Fed 4-Dimethylaminoazobenzene. S. Sorof and P. P. Cohen.—p. 376.
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Diseases of Chest, Chicago

19:493-614 (May) 1951

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Angiocardiographic Findings in Pulmonary Tuberculosis. I. Steinberg, H. I. McCoy and C. T. Dotter.—p. 510.
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Experiences with Dry BCG Vaccine in the Philippines. S. Bona-de Santos, F. Duñgo and A. Aoanan.—p. 544.
*Role of Para-Aminosalicylic Acid (PAS) in Emergence of Streptomycin-Resistant Tubercle Bacilli. W. G. Lewis, L. S. Arany and B. H. Johnson.—p. 566.
Psychogenic Factors in Chest Diseases. A. S. Anderson.—p. 570.
Classification of Pulmonary Tuberculosis with Five Digit Code. B. Papanicolaôu.—p. 577.
Standardized Oblique Roentgenography of Chest. S. W. Atwell.—p. 585.
Benign Fibroma of Mediastinum. J. W. Fouche.—p. 589.
Migratory Pneumonia Without Eosinophilia. D. Biber and A. Buckler. —p. 593.
Spontaneous Rupture of Esophagus. H. L. Rigdon and N. D. Ellis. —p. 598.

PAS and Resistance of Tubercle Bacilli to Streptomycin.—The studies reviewed in this paper were carried out in participation with the Veterans Administration-Army-Navy Research Program, which used paraaminosalicylic acid in combination with streptomycin. The aim was to delay streptomycin resistance by lowering of the total dosage of streptomycin and by addition of a synergistic drug. Streptomycin resistance was studied with the following therapeutic schedules: (1) streptomycin, 1 gm. daily for 42 days; (2) streptomycin, 1 gm. daily, paraaminosalicylic acid, 8 gm. daily, for 120 days; (3) streptomycin, 1 gm. daily, paraaminosalicylic acid, 15 gm. daily, for 120 days; (4) streptomycin, 1 gm. daily, paraaminosalicylic acid, 12 gm. daily, for 90 days, and (5) streptomycin, 1 gm. daily, paraaminosalicylic acid, 12 gm. daily, for 120 days. Streptomycin sensitivity tests were recorded at 60, 90, and 120 days after the start of treatment. There was a decided reduction in the number of patients showing tubercle bacilli that were resistant to streptomycin when combined therapy with paraaminosalicylic acid was employed.

Gastroenterology, Baltimore

17:479-628 (April) 1951

Infarcts of Liver. K. R. Woolling, A. H. Baggenstoss and J. F. Weir. —p. 479.
Post-Bulbar Duodenal Ulceration. W. M. Lonergan and A. Kahn Jr. —p. 494.
Abdominal Aortic Aneurysm with Rupture into Duodenum: Report of Eight Cases. A. E. Hirst Jr. and J. Affeldt.—p. 504.
Pharyngeal Anesthesia for Gastroscopy and Esophagoscopy—New Simplified Technique. S. Selesnick.—p. 515.
Amebiasis in Veterans: IV. Results of Treatment with Aureomycin and Chloramphenicol. H. C. Conn.—p. 517.
*Jaundice in Chronic Hepatitis (Cirrhosis of Liver). W. E. Ricketts. —p. 523.
*Ineffectiveness of Enterogastrone on Severe Chronic Peptic Ulcer in Man. A. Wollum and H. M. Pollard.—p. 535.
Use of Testosterone Propionate Following Extensive Resection of Small Intestine. I. J. Pincus.—p. 541.
Effect of Terramycin on Intestinal Flora. J. A. Rivera and V. M. Sborov. —p. 546.
Oral Banthine, Effective Depressor of Gastrointestinal Motility. M. J. Lepore, R. Golden and C. A. Flood.—p. 551.
Some Effects of Banthine on Pancreatic Secretion. D. Annis and G. A. Hallenbeck.—p. 560.
Studies on Bromsulfalein Excretion: I. Results of Successive Daily Bromsulfalein Tests and Effects of Galactose on Bromsulfalein Excretion. E. S. Cohen, T. L. Althausen, K. Uyeyama and H. Treager.—p. 572.

Jaundice in Chronic Hepatitis.—In order to determine the significance and pathogenesis of jaundice in portal cirrhosis, Ricketts studied 28 consecutive patients, three children and 25 adults (22 males and six females) with pronounced jaundice by simultaneous clinical and histological observation and by conventional biochemical determinations. A previous history of alcoholism was detected in 13 of the 28 patients and an insidious onset of jaundice in 21. The following findings, occurring singly or in combination, were significant in the diagnosis of chronic hepatitis: collateral circulation of the abdomen, spider nevi, telangiectasis, hard or nodular liver, and varicose veins of the esophagus. Punch biopsy of the liver was the most important single diagnostic procedure used, since it served to demonstrate not only liver fibrosis but also changes of the liver parenchyma. Jaundice in patients with cirrhosis represents active parenchymatous liver disease and as such cannot be regarded as a manifestation of "compensated cirrhosis." Pathologically there were active changes of the liver parenchyma that varied considerably in type and severity. There was no relation between jaundice and the degree or type of fibrosis. Jaundice appeared as a slight, transitory, almost unnoticed episode in the course of chronic hepatitis, or most commonly it was accompanied by other symptoms and findings of liver failure, such as edema, ascites, and encephalopathy. Jaundice is to be considered a very serious sign; nine of the 28 patients died during the episode of jaundice, eight of liver failure and one of liver failure and gastrointestinal bleeding. The presence of jaundice contraindicates abdominal surgery. The importance of medical management of portal cirrhosis with jaundice is emphasized, since even patients with severe liver failure can recover clinically. Recovery is accompanied by disappearance of degenerative features, regeneration of the liver parenchyma, and pronounced improvement of parenchymal function.

Ineffectiveness of Enterogastrone in Peptic Ulcer.—Thirty-four patients, 32 men and two women with chronic peptic ulcer, were treated with enterogastrone for prolonged periods. Enterogastrone was given orally to 19 patients, of whom two were given doses of 6 gm. daily for an average of 6.5 months, five were given 8 gm. daily for an average of 11.5 months, and 12 were given 16 gm. daily for an average of 7.2 months. Intramuscular injections of 200 mg. of enterogastrone were given to 15 patients six times a week for an average of 5.5 months. Only eight of the 34 patients, with an average duration of the ulcer history of 14.2 yr., were significantly improved, as shown by decreased recurrence rate, absence of complications, or lack of need for surgery. Of these eight patients, three had received parenteral enterogastrone, four had received 16 gm. of oral enterogastrone daily, and one had received 8 gm. of oral enterogastrone daily. Twenty-six patients had an increase in recurrences, more intense symptoms, or ulcer complications such as obstruction, hemorrhage, or perforation. Eighteen patients underwent surgical treatment because of ulcer complications or intractable symptoms. Prolonged oral administration of enterogastrone in doses of 16 gm. daily or of intramuscularly administered enterogastrone did not significantly alter the rate of gastric secretion, free hydrochloric acid content of gastric juice, or pepsin content of gastric juice in the authors' patients. Gastric motility was also not altered.

Indiana State Medical Assn. Journal, Indianapolis

44:353-432 (May) 1951

*Cardiotoxic Action of Intravenous Procaine. F. S. Carter and J. L. Eisaman.—p. 369.
Surgical Treatment of Hyperthyroidism. L. H. Kornafel.—p. 374.
Are Shoe Fitting Fluoroscopes a Health Hazard to the Public in Indiana? H. E. Bumstead and L. W. Spolyar.—p. 376.
Shoulder Pinning for Neck Fractures of Humerus. F. E. Hagie.—p. 379.
Clinical Management of Peptic Ulcers in General Practice. O. R. Bowen.—p. 381.

Cardiotoxic Action of Intravenously Administered Procaine.—Electrocardiographic studies were made on 42 patients in connection with procaine infusions. A total of 257 electrocardiograms were made in connection with 263 infusions. The tracing made prior to the first infusion served as the control. In most cases procaine infusions were given daily; others received infusions on alternate days. Treatment was given until either an excellent therapeutic result was obtained or further infusions failed to improve the condition. Analysis of the electrocardiograms revealed P-wave alterations in four cases, prolongation of the P-R interval in 5 cases, a decrease in 17 cases and an increase in two cases in the QRS voltage, and a T voltage decrease in 16 cases and an increase in eight cases. Twelve patients showed no change following repeated infusions; of the others, some showed one and others several changes. In two cases the changes were sufficiently severe to justify cessation of treatment. The duration of the changes was variable and could not be correlated with their extent. In general, the changes were gone in 24 hr., but in several patients they persisted longer than three days. The following conclusions are drawn on the basis of the described observations: Intravenously administered procaine has a depressant action on both the myocardium and the conduction system. This action is beneficial in ventricular arrhythmias but does not occur in auricular arrhythmias. Intravenously administered procaine should be used with caution in persons with heart disease; electrocardiograms should be made before and during treatment.

Journal of Applied Physiology, Washington, D. C.

3:637-690 (May) 1951. Partial Index

Effect of High Carbon Dioxide and of Low Oxygen Concentration on Fusion Frequency of Flicker E. Simonson and P. Winchell.—p. 637.
Oximetric Determinations of Cardiac Output Responses to Light Exercise. W. Sleator Jr., J. O. Elam, W. N. Elam and H. L. White.—p. 649.
Diurnal Variations in Body Temperatures. H. C. Mellette, B. K. Hutt, S. I. Askovitz and S. M. Horvath.—p. 665.
Relation of Specific Gravity to Body Build in Group of Healthy Men. C. W. Dupertuis, G. C. Pitts, E. F. Osserman and others.—p. 676.

Journal of Aviation Medicine, St. Paul

22:87-176 (April) 1951

High Altitude-High Velocity Flying with Special Reference to Human Factors: III. Bare Skin Hazard from Frostbite in Escape from Aircraft. A. P. Webster and H. A. Smedal.—p. 89.
Human Time Factor in Flight: II. Chains of Latencies in Vision. H. Strughold.—p. 100.
Voluntary Tolerance of Human to Impact Accelerations of Head. C. F. Lombard, S. W. Ames, H. P. Roth and S. Rosenfeld.—p. 109.
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Study of Bailouts for Five-Year Period in the U. S. Navy. W. L. Jones.—p. 123.
Comparative Experimental Studies of Effects of Simulated High Altitudes on Five Vertebrates. B. Metz.—p. 132.
Comparison of Scopolamine Hydrobromide and Dramamine in Treatment and Prevention of Airsickness. J. D. Boland and A. D. Grinstad.—p. 137.
In-Flight Feeding Problems in the USAF. H. C. Dyme.—p. 146.
Pilot Candidate Selection Research Project. V. W. Lyon.—p. 152.
Pick-Up and Amplifier for the Ballistocardiograph. C. V. Pestel and J. P. Marbarger.—p. 156.

Journal of Bacteriology, Baltimore

61:379-526 (April) 1951. Partial Index

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Adaptation of Quality Control Chart Methods to Bacterial Vaccine Potency Testing. H. C. Batson, M. Brown and M. Oberstein.—p. 407.
Effect of Aeration on Growth of Aerobacter Aerogenes and Escherichia Coli, with Reference to Pasteur Mechanism. S. Dagley, E. A. Dawes and G. A. Morrison.—p. 433.
Improved CO_2 Cabinet for Low Temperature Storage of Infectious Agents with Gaseous CO_2 Excluded from Specimen Compartment. F. L. Horsfall Jr. and H. S. Ginsberg.—p. 443.
Electron Microscopic Observations of Flagellation in Some Species of Genus Treponema Schaudinn. J. H. L. Watson, J. J. Angulo, F. León-Blanco and others.—p. 455.
Utilization of Nitrogen in Various Compounds by Clostridium Pasteurianum. E. D. Rosenblum and P. W. Wilson.—p. 475.
Nitrogen Fixation and Hydrogenase in Various Bacterial Species. E. S. Lindstrom, S. M. Lewis and M. J. Pinsky.—p. 481.
Adaptations in Growth Factor Requirements for Lactic Acid Bacteria. V. H. Cheldelin and A. P. Hygaard.—p. 489.
Growth of Bacteria in Charcoal-Cellophane System. A. N. Gorelick, D. D. Mead and E. H. Kelly.—p. 507.

61:527-648 (May) 1951. Partial Index

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Studies on Variation of Bacterium Tularense. H. T. Eigelsbach, W. Braun and R. D. Herring.—p. 557.
Prophylaxis of Experimental Gas Gangrene in Mice. W. I. Taylor and M. V. Novak.—p. 571.
Influence of Vitamin B_{12} on Oxidation by Mutant Strain of Escherichia Coli. E. L. Oginsky, P. H. Smith, N. E. Tonhazy and others.—p. 581.
Action of Streptomycin: V. Formation of Citrate. W. W. Umbreit, P. H. Smith and E. L. Oginsky.—p. 595.
Action of Streptomycin on Respiration of Streptomyces Griseus. E. L. Oginsky, P. H. Smith and W. W. Umbreit.—p. 639.
New Bacteriophage Active Against Lactatic Streptococcus. K. I. Williamson and W. S. Bertaud.—p. 643.

Journal Clin. Endocrinology, Springfield, Ill.

11:455-558 (May) 1951

Metabolic Effects of ACTH upon Pre-Existing Diabetes Mellitus. S. S. Fajans, L. H. Louis and J. W. Conn.—p. 455.
Urinary Prolactin Excretion in Man. R. L. Coppedge and A. Segaloff. —p. 465.
Sexual Trends in Female Pseudohermaphrodism. F. Hinman Jr.—p. 477.
Treatment of Adolescent Acne with Topical Application of Estrogens. M. J. Whitelaw.—p. 487.
Scintillation Counter in Clinical Studies of Human Thyroid Physiology Using I^{131}. H. C. Allen Jr., R. L. Libby and B. Cassen.—p. 492.
•Irradiation of Pituitary in Treatment of Malignant Exophthalmos. W. H. Beierwaltes.—p. 512.
Growth Hormone and Experimental Diabetes. F. G. Young.—p. 531.
Pituitary Necrosis and Diabetes Mellitus. E. R. Marzullo and M. B. Handelsman.—p. 537.

Irradiation of Pituitary in Malignant Exophthalmos.—The initial symptoms of "malignant" exophthalmos are usually orbital, retro-orbital, or frontal pain, burning, lacrimation, photophobia, and, less commonly, diplopia. The eyes become proptosed; the lids swell, and edema and fluid appears under the conjunctivas. Conjunctival sacs may protrude between the lids or hang down over the cheeks. When the patient loses his ability to close the eyes while asleep, exposure keratitis, corneal ulceration, panophthalmitis, surgical loss of the orbit, or death may follow. Decrease in protrusion of the eyes is rarely brought about by lowering of the basal metabolic rate when it is elevated or by the administration of desiccated thyroid when it is not. Surgical decompression of the orbit is effective in this condition, but this is a relatively formidable procedure. Roentgen therapy directed to the pituitary was used in 10 patients with malignant exophthalmos and in one patient with progressive exophthalmos. These patients were selected for treatment because their eye status became worse during an average control period of 10.7 months, during which time they were treated with desiccated thyroid. Seven of the 10 patients with malignant exophthalmos and the one patient with progressive exophthalmos had significant recession in exophthalmos. Only one of the three nonresponsive patients showed a significant increase in exophthalmos. Transient epilation resulted in all patients, and there were occasional headaches during the first few weeks after treatment. Patients who responded showed recession at an average interval of three months and maximum recession at an average interval of 12 months after roentgen irradiation.

Journal of Experimental Medicine, New York

93:415-512 (May) 1951

Role of Alkaline Phosphatase in Osteogenesis. R. S. Siffert.—p. 415.
Age of Host and Other Factors Affecting Production with Urethane of Pulmonary Adenomas in Mice. S. Rogers.—p. 427.
Radioautographic Visualization of Sulfur-35 Disposition in Articular Cartilage and Bone of Suckling Rats Following Injection of Labelled Sodium Sulfate. D. D. Dziewiatkowski.—p. 451.
Joint Action of Chemical Carcinogen and Neoplastic Virus to Induce Cancer in Rabbits: Results of Exposing Epidermal Cells to Carcinogenic Hydrocarbon at Time of Infection with Shope Papilloma Virus. S. Rogers and P. Rous.—p. 459.
Studies on Mechanism of Shwartzman Phenomenon: Certain Factors Involved in Production of Local Hemorrhagic Necrosis. C. A. Stetson Jr.—p. 489.
Lymphoid Lesions in Poliomyelitis. S. C. Sommers, J. C. Wilson and F. W. Hartman.—p. 505.

Journal of Infectious Diseases, Chicago

88:105-206 (March-April) 1951. Partial Index

Effects of Protein Deficiency on Resistance of Rats to Infection with Spirochetes of Relapsing Fever. K. Guggenheim, E. Buechler-Czaczkes and S. Halevy.—p. 105.
Human Carrier of Psittacosis Virus. K. F. Meyer and B. Eddie.—p. 109.
Dynamic Aspects of Nitrogen Metabolism of Plasmodium Gallinaceum in Vivo and in Vitro. N. B. Groman.—p. 126.
Use of Gastric Mucin to Lower Resistance of Laboratory Animals to Systemic Fungus Infections. R. E. Strauss and A. M. Kligman.—p. 151.
Studies on Plasmodium Gallinaceum in Vitro. D. J. Taylor, J. Greenberg, E. S. Josephson and A. P. Ray.—p. 158.
Toxic and Allergic Manifestations Caused by Tissues and Fluids of Ascaris. J. F. A. Sprent.—p. 168.
Response of Syrian Hamster to Oral Administration of Modified Newcastle Disease Virus. R. L. Reagan, D. M. Schenck, H. O. Werner and A. L. Brueckner.—p. 178.
Search for Poliomyelitis Virus in House Dust and Study of Effects of Drying on Viability of Virus. H. K. Faber, L. Dong and R. J. Silverberg.—p. 180.

Journal of International College of Surgeons, Chicago

15:531-668 (May) 1951

Diagnosis of Surgical Diseases of Spleen. T. H. Bate.—p. 531.
Study of Breast Secretion for Detection of Intramammary Pathologic Change and of Silent Papilloma. D. Jackson, D. A. Todd and P. L. Gorsuch.—p. 552.
Endocrine Therapy in Gynecologic Practice. J. Kotz and M. S. Kaufman. —p. 569.
Polyethylene Intubation in Reimplantation of Oviducts. J. I. Perl.—p. 576.
Personal Evaluation of Vagotomy in Treatment of Peptic Ulcer. K. C. Sawyer.—p. 585.
Pilonidal Sinus: Etiology of Recurrence. H. R. Grau.—p. 591.
Recurrent Inguinal Hernia. D. P. Hall.—p. 605.
Management of Eye Injuries by the General Surgeon in Absence of an Ophthalmologist. F. L. P. Koch.—p. 614.
Foreign Bodies in Hepatic Ducts: Review of Literature. M. Thorek. —p. 624.
Eosinophilic Variations After Irradiation of Adrenal Glands. M. A. Manzanilla and M. A. Manzanilla Jr.—p. 628.
Berylliosis and Silicosis. R. Pomeranz and H. A. Brodkin.—p. 633.
•Retropubic Prostatectomy: Modification of Millin Operative Technic (1945). C. M. Carruthers.—p. 639.
Problem of Thyroid Gland from Standpoint of Anesthesiologist. J. S. Lundy.—p. 646.
Concept of Mobilization and Its Relation to Poliomyelitis. H. E. Billig Jr.—p. 649.

Retropubic Prostatectomy: Modification of Millin Technique.—This is a report of Carruthers' modification of Millin's technique of prostatectomy and is based on a series of 53 consecutive prostatectomies, performed during the last two and one-half years. This modification allows better exposure, anatomic dissection, and control of bleeding, with minimal shock to the patient. It is applicable in all types of prostatic obstruction and makes this field available to the general surgeon or urologist who is not trained in the highly specialized field of transurethral resection. The gland is completely removed, and there is no tendency to stricture formation. Postoperative urethrograms show the prostatic cavity to be confluent with the urinary bladder. Nursing and hospital care are minimal and well suited to a general hospital. Confinement to bed has been shortened, with an early return to normal micturition. Sexual function has not been disturbed.

Journal of Investigative Dermatology, Baltimore

16:295-378 (May) 1951

Injection and Ingestion Test in Cross-Sensitization to Para Group. E. Sidi and S. Dobkewitch-Morrill.—p. 299.
Spectrophotometry of Living Human Skin in Ultraviolet Range. E. A. Edwards, N. A. Finklestein and S. Q. Duntley.—p. 311.
Effects of ACTH and Cortisone on Certain Diseases and Physiologic Functions of Skin: I. Effects of ACTH. M. B. Sulzberger, G. C. Sauer, F. Herrmann and others.—p. 323.
Cyst Formation, Acneform Lesions and Hair Growth Following Intradermal Injection of Staphylococci in Sensitized Rabbits. J. G. Hopkins, J. T. Weld and W. M. Huber.—p. 339.
Pituitary-Adrenocortical Functioning in Patients with Atopic Dermatitis. T. H. Sternberg, P. Butler and M. C. Zimmerman.—p. 355.
Pain Threshold Measurements on Human Skin Following Application of Topical Analgesics. J. D. Hardy, C. B. Potelunas and M. D. Meixner. —p. 369.

Journal-Lancet, Minneapolis

71:169-214 (May) 1951

Congenital Atresia of Esophagus and Intestine: With Report of Cases. G. A. Dodds, L. G. Pray, V. G. Borland and W. E. Le Bien.—p. 169.
Congenital Duodenal Obstruction: With Report of Two Cases. R. E. Dyson.—p. 174.
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Journal of Pediatrics, St. Louis

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Id.: II. Frequency of Bulbar Paralysis, 1944-1949. M. Siegel, M. Greenberg and M. C. Magee.—p. 548.
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J. Pharmacology & Exper. Therap., Baltimore

101:317-404 (April) 1951

Effects of Potassium, Ammonium, Calcium, Strontium and Magnesium on Electrogram and Myogram of Mammalian Heart Muscle. S. Garb.—p. 317.
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Adrenergic Blocking Action of Phenoxyethyl Analogues of Dibenamine. M. Nickerson and G. M. Nomaguchi.—p. 379.

Journal of Thoracic Surgery, St. Louis

21:433-542 (May) 1951

Lung Function Studies: VII. Effect of Pneumonectomy on Respiratory Dead Space. W. S. Fowler and W. S. Blakemore.—p. 433.
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Pathology of Experimentally Produced Lye Burns and Strictures of Esophagus. L. H. Bosher Jr., T. H. Burford and L. Ackerman.—p. 483.
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Mobilization of Arch of Aorta in Order to Reach Bifurcation of Trachea. O. Monod, G. Babou, E. Kateb and S. Ghazi.—p. 492.
Tracheotomy, Useful Procedure in Thoracic Surgery, with Particular Reference to Its Employment in Crushing Injuries of Thorax. B. N. Carter and J. Giuseffi.—p. 495.
Coarctation of Aorta at Level of Diaphragm Treated Successfully with Preserved Human Blood Vessel Graft. E. J. Beattie Jr., F. N. Cooke, J. S. Paul and J. A. Orbison.—p. 506.
Effective Method for Bronchial Closure. R. A. Rasmussen.—p. 513.
Bronchial Yardstick. E. B. Emerson Jr.—p. 516.
Clinically Indeterminate Pulmonary Fibrosis: Pathologic Study. H. D. Peabody Jr., H. J. Moersch and J. E. Edwards.—p. 519.
*Oxygen Administration: Emergency Method When Intratracheal Tube Fails with Chest Open. O. C. Brantigan.—p. 532.
Bronchial Adenoma: Analysis of 26 Cases. N. C. Delarue.—p. 535.

Oxygen Administration When Intratracheal Tube Fails.—Brantigan describes a new technique of emergency oxygen administration for use when an intratracheal tube slips out during anesthesia. A no. 17 intravenous needle, which is attached by rubber tubing to an oxygen tank, is inserted into the bronchus. The assistant holds the needle in place, and the operator controls the flow of oxygen. The no. 17 needle acts as a safety mechanism, since it tends to prevent an excessive flow. The escape of oxygen from the glottis aids in reinsertion of the intratracheal tube, which can be done without haste. It is suggested that the oxygen tank and sterile rubber tubing with needle attached be available in the operating room.

Journal of Urology, Baltimore

65:497-692 (April) 1951. Partial Index

Experimental Studies on Male Reproductive System. C. R. Moore.—p. 497.
Lower Nephron Syndrome in Children. H. I. Riddell.—p. 513.
Progressive Synergistic Gangrene of Skin Following Incision and Drainage of Renal Cortical Abscess. W. F. Welton.—p. 519.
Ureteral Calculi: Experiences in Looped Catheter Management. M. Ellik and L. A. Newton.—p. 532.
Glandular Tumors of Bladder. W. M. Coppridge, L. C. Roberts and D. A. Culp.—p. 540.
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*Cystectomy and Urinary Diversion in Carcinoma of Bladder. G. J. Thomas, D. C. Malcolm and A. J. Bischoff.—p. 553.
Hydrodynamics of Upper Urinary Tract After Mucosal Ureterosigmoidostomy: Case Report. J. M. Whisenand and V. Moore.—p. 564.
Complications and End Results Following Uretero-Intestinal Anastomosis. J. J. Crane, F. A. Bennetts, G. H. Gummess and J. F. Crane.—p. 571.
*Substitute Bladder and Urethra, Using Cecum as Bladder and Ileum as Urethra. J. W. Merricks, R. K. Gilchrist, H. Hamlin and I. T. Rieger.—p. 581.
Congenital Diaphragm and Fistula of Penile Urethra. H. C. Tseng.—p. 590.
Conservative Treatment of Highly Obstructive Cancer of Prostate. R. B. Mullenix and R. J. Prentiss.—p. 608.
Malignant Disease of Testicle. J. C. Kimbrough and J. C. Denslow.—p. 611.
Sources of Danger in Urinary Extravasation: Hazard of Perforation During Transurethral Prostatectomy. H. M. Weyrauch, R. A. Peterfy and J. L. Goebel.—p. 615.
March Hemoglobinuria. R. T. Plumb.—p. 655.
Urogenital Aspects of Coccidioidomycosis: Review of Literature and Report of Two Cases. J. G. Rohn, J. C. Davila and T. E. Gibson.—p. 660.
*Effect of Combined Therapy on Emergence of Drug Resistant Bacteria in Urinary Tract Infections: Observations on Origin of Resistant Strains. L. J. Kimmelman, H. H. Zinsser and M. Klein.—p. 668.

Cystectomy and Urinary Diversion in Carcinoma of Bladder.—Cystectomy was done for cancer of the bladder in 36 patients at two Veterans Administration hospitals, one of which was a tumor center. A total of 325 patients with carcinoma of the bladder were observed at these hospitals. In patients who underwent cystectomy an attempt at removal of cancer of the bladder had been delayed an average of three and a half years. From their study of these cases, the authors made the following conclusions: Gross hematuria may not be the first symptom of cancer of the bladder, but, since most tumors of the bladder produce blood and other cells in the urinary sediment long before gross hematuria occurs, such findings should suggest a complete urologic examination. The cystoscopist, who can view the entire bladder, can make a more accurate diagnosis of malignant change than the pathologist who examines only a bit of tissue removed transurethrally. Because of frequent errors in the study of biopsy specimens, surgical exploration of the bladder and the surrounding structures should be done before deciding on a cystectomy. At this exploratory operation the diversion of the urinary stream into the bowel or into the skin can be undertaken. Cystectomy should be used only when the degree of malignancy is no greater than grade 2 and when the cancer is confined to the lumen of the bladder. Metastases occur early and may be widespread with any degree of malignancy. Diversion of the urinary stream into the sigmoid or through the skin is the best palliative treatment. Implantation into the skin is the safest method. In this series there was a high mortality rate following cystectomy. Two patients lived four years and 11 months, and one lived five years and six months. Eight (29%) lived more than a year. One lived more than two years. The average survival was 10 months. There were local recurrences in many cases, and metastases to the bones also occurred frequently.

Substitute Bladder and Urethra.—In the treatment of certain tumors of the rectum, uterus, bladder, and prostate, in certain congenital anomalies and in conditions such as extensive vesicovaginal and rectovaginal fistulas, it may be highly desirable to divert the urinary stream above the bladder. Numerous operations have been designed, but each has limitations. In the technique described in this paper the new bladder is made from the isolated terminal ileum, cecum, and ascending colon. Bowel continuity is reestablished by ileocolostomy, and the ureters are transplanted to the new bladder. The terminal ileum is brought out to the abdomen to serve as the urethra and an indwelling catheter is left in the new bladder. Finally, the patient is taught how to catheterize himself often enough to prevent overflow leakage. This arrangement has the following advantages: (1) There is no contamination by the fecal stream. (2) The ureteral anastomoses are easily made and can be covered by peritoneum. (3) A cystoscope can be passed to the new bladder and the ureteral orifices can be dilated or otherwise treated if need be. (4) No device is needed to prevent leakage. (5) There is no limitation of radical surgery when dealing with malignant lesions. In animal experiments and in the follow-up study of human patients the authors encountered no real contraindication to this procedure.

Combined Therapy and Drug Resistance.—This study shows that the therapeutic effect of combined antibacterial agents is correlated with the inhibition of drug resistance. A total of 37 cases, including both uncomplicated urinary tract infections (e. g., cystitis, pyelonephritis, and urethritis) and those complicated by pathological changes, such as calculi, strictures, and obstructions, were studied. The patients received the following daily dosage for a total of seven days: streptomycin, 1.0 gm., intramuscularly; penicillin, 200,000 units, intramuscularly; sulfadiazine, 2.0 gm., orally. Sterile urine cultures were obtained in 16 cases, 14 of which were uncomplicated urinary tract infections. Therapy was bacteriologically unsuccessful in 21 cases, 19 of which were characterized by some complication. In these 19 cases, bacteria resistant to all three drugs regularly emerged. A study of resistant strains in the urine and feces of seven patients strongly indicated that many of the resistant strains in the urine had their origins in the fecal flora of the patient. Good clinical response was obtained in virtually all the cases in spite of persistent bacilluria. The combined drugs produced no evidence of toxicity. If combined therapy is to be of permanent value, efforts must be made to remove the cause of the obstruction or complication.

Kansas Medical Society Journal, Topeka

52:209-256 (May) 1951

Infantile Cortical Hyperostoses. J. F. Bowser.—p. 209.
Intracranial Aneurysms. J. Hibbard, R. L. Drake and L. E. Vin Zant.—p. 213.
Abdominal Distention: Prevention and Treatment with Stigminene Bromide. L. J. Hanis and C. D. Kobler.—p. 216.
Diagnosis and Treatment of Subdural Hematomas in Infants. J. R. Patterson.—p. 218.

Medicine, Baltimore

30:81-196 (May) 1951

Benign Intramural Tumors of Stomach: Review with Special Reference to Gross Pathology. E. D. Palmer.—p. 81.
Ion Exchange Resins in Edema. E. W. McChesney, W. Dock and M. L. Tainter.—p. 183.

Michigan State Medical Society Journal, Lansing

50:441-552 (May) 1951

Obstruction of Common Bile Duct by Stones. W. H. Cole.—p. 481.
Allergic Myalgia. T. G. Randolph.—p. 487.
Common Geriatric Dermatoses. E. W. Netherton.—p. 495.
Kala-Azar: Report of Case and Review of Recent Literature. T. A. McInerney and R. E. Ryde.—p. 501.
Review of Endometriosis: Summary of 32 Cases of Hurley Hospital. J. W. Thompson.—p. 504.
Congenital Paralysis of Inferior Oblique. H. W. Brown.—p. 509.

Military Surgeon, Washington, D. C.

108:369-466 (May) 1951. **Partial Index**

Civil Defense Planning. N. C. Kiefer and R. H. Flinn.—p. 372.
Definitive Treatment of Pulmonary Tuberculosis: General Therapeutic Principles as They Apply to Various Types of Chest Lesions. C. W. Tempel and J. H. Forsee.—p. 375.
Postgraduate Medical Education Program of the United States Air Force Medical Service. R. B. Jones.—p. 408.
*Experimental Use of Bone Marrow in Acute Radiation Injury. J. M. Talbot and E. A. Pinson.—p. 412.
Division Combat Medical Service. T. Fox.—p. 427.
Potentialities of Biological Warfare Against Man—Epidemiological Appraisal. A. D. Langmuir.—p. 429.

Bone Marrow in Radiation Injury.—This report deals with the use of bone marrow in animals severely injured by acute, whole body exposure to roentgen irradiation. The experimental approach was based on the fact that in this type of injury there is extensive bone marrow damage with extreme depression of hematopoiesis and on the hypothesis that this results in an unusual demand for the products of marrow metabolism. Preliminary studies of bone marrow homotransplants in rats with marrow depressed by benzene injections and by whole body roentgen irradiation suggested that the transplants would survive in a reasonably healthy condition for an approximate minimum of four weeks. In the main experiment one group of white rats exposed to 500 r total body irradiation was given one intramuscular injection of marrow and a similar group two injections of marrow three to four days apart. Another series of rats received intrahepatic marrow homotransplants following single, whole body exposures to 700 r. A control group not operated on and a special control group the hind limbs of which were two-thirds to three-fourths shielded by 1.5 cm. of lead were simultaneously studied. There was no apparent benefit in terms of survival and postirradiation total leukocyte counts in the case of the marrow-transplanted group; however, the survival of these animals, each of which experienced general anesthesia, laparotomy, and injection into the liver, was at least as good as that of the controls not operated on. The shielded group had a mean survival time 2.4 times that of both the animals with transplants and the control animals.

Minnesota Medicine, St. Paul

34:389-516 (May) 1951

Fluid and Electrolyte Balance in Intestinal Obstruction. F. A. Coller and R. E. L. Berry.—p. 414.
*Primary Intestinal Anastomosis. I. S. Ravdin and W. DeMuth Jr.—p. 419.
Prognostic Factors in Colonic Malignancy. C. F. Dixon.—p. 424.
Pulmonary and Extrapulmonary Tuberculosis with Discussion of Host Response to Tuberculosis. D. T. Smith.—p. 428.
Problems of Rural Medical Care. F. D. Murphy.—p. 433.
Rheumatic Pneumonia. R. B. Tudor and R. R. Kling.—p. 437.
Operating Room Cholangiograms. A. Zierold.—p. 439.
Practical Points in Allergy. J. H. Shaffer.—p. 442.

Primary Intestinal Anastomoses.—This and other papers in this issue pay tribute to Owen H. Wangensteen for his work in relieving gastric and intestinal distention by intubation. Intestinal intubation as introduced by Wangensteen and extended by others has reduced the morbidity and mortality rates of many diseases and procedures. Ravdin and DeMuth say that with its help bowel resection and primary anastomosis has become a safe operation in many patients. During the past five years there has been a steady increase in the number of primary anastomoses following bowel resection, regardless of location of the lesion. The control of distention is the clue to successful preparation of the bowel for primary anastomosis. The authors report results obtained in the five-year period between 1946 and 1950 inclusive in 394 patients in whom primary intestinal anastomoses accompanied by intubation and suction drainage were the sole source of decompression. Intestinal resections were done in all but 38 of the reported cases. The over-all mortality rate was 3.8%. Primary anastomosis following resection of bowel segments or used alone in bypassing inoperable lesions, is a safe, rational procedure that saves the patient both time and prolonged incapacity. In the treatment of cancer it in no way modifies the radical approach to the eradication of the disease.

Neurology, Minneapolis

1:179-260 (May-June) 1951. **Partial Index**

Importance of Neuroanatomy in Field of Neuropathology. C. Vogt and O. Vogt.—p. 205.
*Succinate Therapy in Multiple Sclerosis. R. B. Aird.—p. 219.
Diabetic Neuropathy and Its Prognosis. S. H. Epstein.—p. 228.
Aphasia in Deaf Mute. L. L. Tureen, E. A. Smolik and J. H. Tritt.—p. 237.
Medical Treatment of Psychomotor Epilepsy. J. K. Merlis.—p. 245.

Succinate Therapy in Multiple Sclerosis.—Sodium succinate was administered intravenously (20 cc. of a 30% solution) to 10 patients with multiple sclerosis and orally (4 to 5 gm. of powder in 1 oz. [30 cc.] of water three times a day) over prolonged periods to 22 patients with multiple sclerosis. Subjective improvement was reported in 80%, and objective improvement was observed in approximately two-thirds of the patients by both methods of treatment. Follow-up observations on patients treated orally with succinate suggested that approximately one-half have benefited. Beneficial effects consisted of (1) improvement in dyssynergia, ataxia, dysmetria, balance, and gait, (2) improvement in the flexor withdrawal reflex and clonus in some patients, and (3) subjective improvement in the appreciation of vibration and objective improvement in position sense and skin writing. Toxic effects were observed in one patient treated intravenously and in six patients given oral succinate. The toxic reactions to oral administration consisted of gastrointestinal and genitourinary effects and were not alarming. Three of these patients were able to continue treatment with benefit on reduced doses. Deterioration on discontinuance of the succinate was observed in four instances, and all these patients improved when therapy was resumed. Recurrent episodes have been observed in three patients. The rationale for the use of sodium succinate in multiple sclerosis is discussed.

New England Journal of Medicine, Boston

244:699-742 (May 10) 1951

American Physician and His Opportunities for Increased Service Through Public Health. J. S. Simmons.—p. 699.

*Acid Débridement of Burns with Phosphoric-Acid Gel. R. J. Schweitzer and J. T. Bradsher Jr.—p. 705.

Delirium and Coma Precipitated by Oxygen in Bronchial Asthma Complicated by Respiratory Acidosis. H. D. Beale, I. W. Schiller, M. H. Halperin and others.—p. 710.

Survey of Present-Day Treatment of Diabetes Mellitus. S. B. Beaser. —p. 714.

Medicine as Social Instrument: Medical Social Service. I. M. Cannon. —p. 717.

Acid Débridement of Burns.—Attempts have been made to find some agent that would selectively digest or remove the necrotic slough that follows severe burns. Connor and Harvey in 1944 used pyruvic acid starch paste as such an agent, but since this substance had certain disadvantages, other methods were tested. Only phosphoric acid was equal to pyruvic acid in efficiency of slough removal and low degree of irritation. At the Boston City Hospital phosphoric acid (85%) was used as the débriding agent. This was added to a water-soluble vehicle to form a stable 0.7 molar (5%) phosphoric acid gel (pH, 1.02). Immediately after application of the phosphoric acid gel a burning sensation was felt, which lasted from 15 to 30 min. Premedication with small amounts of meperidine (demerol®) hydrochloride or morphine relieved this discomfort. At the first dressing, parallel incisions were made in the slough, to increase the accessibility of the agent to the site of its activity. A dam of petrolatum gauze was placed about the burn to prevent the mixture from seeping away; later, felt strips impregnated with petrolatum were found most satisfactory to accomplish this. The wound was covered with phosphoric acid gel, and petrolatum strips and fluffed gauze were applied over this. Dressings were changed daily or every other day. When the cleavage plane became apparent the separation of partially débrided and undermined areas could be hastened mechanically. Epithelial islands were apparently not damaged by the débriding agent. Areas with first, second, and third degree burns could be treated beneath the same dressing with safety. After débridement, the wounds were dressed with a weak chlorinate solution until the operating schedule permitted skin grafting or, in the case of superficial second degree burns, until healing had occurred. Phosphoric acid gel was employed in 11 cases and proved a simple, safe, selective, and rapid method of débridement. The course of six of these patients is described.

New Jersey Medical Society Journal, Trenton

48:137-182 (April) 1951

Trends in Nursing Education and Practice. R. A. Schaaf.—p. 139.

Diabetic Ketosis. P. B. Ferrary.—p. 141.

Very Low Sodium Diet: Both Palatable and Variable. G. G. Ornstein. —p. 145.

The New Jersey Formulary—Sixth Edition. T. D. Rowe and J. L. Varriano.—p. 150.

Hematometria from Complete Amputation of Cervix During Labor. N. Karshmer.—p. 151.

Suprapubic Prostatectomy. H. M. Ill.—p. 153.

Subarachnoid Hemorrrhage Complicating Sicklemia with Review of Neurological Manifestations and Case Report. M. R. Bronstein. —p. 157.

Raynaud's Disease: Surgical Treatment: Report of Two Cases. G. R. Hardy.—p. 159.

Proctologic Considerations in Intestinal Bleeding. F. S. Forte.—p. 161.

Vitamin E Therapy in Treatment of Myopathies. M. M. Kessler.—p. 164.

Drug Delirium Due to Pyribenzamine: Report of Case with Recovery. I. L. Sperling.—p. 166.

New York State Journal of Medicine, New York

51:1105-1232 (May 1) 1951

500 Patient Years of Rheumatic Disease in Children. R. A. Higgons, G. M. Hyde and M. L. Malsch.—p. 1143.

*Analgesic Action of Sodium Gentisate. R. C. Batterman, L. S. Kryle and S. Dann.—p. 1152.

Postoperative Hepatic Failure with Cholorrhea Following Biliary Tract Surgery. M. N. Friedman and E. K. Mehne.—p. 1155.

*Aureomycin and Penicillin in Treatment of Bacterial Pneumonia: Comparative Study. J. L. Leland and N. Allebach.—p. 1159.

Reversibility of Early Bronchiectasis: Its Implications for Therapy and Prevention. W. Finke.—p. 1163.

Pregnenolone: Preliminary Report on Pregnenolone Acetate and Acetoxypregnenolone in Arthritis and Soft Tissue Rheumatism. W. B. Rawls and V. C. Ancona.—p. 1167.

Treatment of Sciatica with Glucurone. J. H. Hodas, H. Laage and H. Brandon.—p. 1171.

Technic for Measuring Pulmonary Arterial Pressures During Pneumonectomy: Preliminary Report. J. G. Converse, A. Stranahan, A. A. Ehler and M. H. Harmel.—p. 1174.

Adequacy of Prothrombin Synthesis During Terramycin Therapy. R. D. Barnard.—p. 1175.

Cataract Associated with Neurodermatitis Disseminata. J. A. Cetner. —p. 1178.

Analgesic Action of Sodium Gentisate.—Forty-three hospitalized medical and surgical patients and 54 ambulatory patients who had pain varying in causation, type, severity, duration, and organ involved received sodium gentisate. The hospitalized patients received 0.3 and 0.6 gm. of sodium gentisate as a single or repeated dose administered orally several times daily. Most of the patients received eight or more doses. The period of observation ranged from one to 55 days. Satisfactory control of pain was achieved in 34 of the 43 hospitalized patients. None of them showed any sign or symptom of toxicity or an untoward reaction to sodium gentisate. The ambulatory patients were advised to take one or two tablets, equivalent to 0.3 and 0.6 gm., respectively, either as a single dose or in repeated doses. The patients were observed for periods of one day to 30 weeks. Of the 54 ambulatory patients, 31 had satisfactory analgesia with the oral administration of either 0.3 or 0.6 gm. of sodium gentisate. Toxicity occurred in six patients (11.1%), of whom four had nausea, one had pruritus, two dizziness, and one abdominal colic. Thirty-five of the 54 patients were observed under similar circumstances for the effectiveness and toxicity of acetylsalicylic acid (aspirin). Nine of these patients noted no difference in relief of the pain from either aspirin or sodium gentisate. Eleven patients preferred aspirin to sodium gentisate, while the remaining 15 preferred sodium gentisate to aspirin. Of the 35 patients who received aspirin, toxic manifestations were noted in 14 (40%). Sodium gentisate, when administered orally, is a safe and effective analgesic for the relief of mild and moderately severe pain. The analgesic potency of sodium gentisate is equivalent to that of aspirin, but it is more useful because of its lower toxicity.

Treatment of Bacterial Pneumonia.—Of 76 patients with bacterial pneumonia, 36 were treated with penicillin and 40 with aureomycin. Most of the penicillin-treated patients received an initial dose of 500,000 units followed by 250,000 units twice a day until they were afebrile for two to three days. The aureomycin-treated patients received an initial dose of 2 gm. of the drug followed by 1 gm. every six hours until defervescence occurred, then 0.5 gm. every six hours until they were afebrile for three days. There were no significant differences in over-all therapeutic response to the two drugs in the two series of patients. In the penicillin series there were two patients, one with a sterile pleural effusion, the other with active tuberculosis, whose temperatures failed to respond promptly. In the aureomycin series there was one death from Staphylococcus pneumonia in a patient with chronic nephritis and uremia. After two days of aureomycin therapy with no improvement, she was given penicillin and streptomycin, which also were ineffective. There were two other patients whose temperature failed to respond promptly; one had a sterile pleural effusion, and the other had Friedländer A bacillus pneumonia, later cured by streptomycin. Fourteen patients (35%) treated with aureomycin had nausea, vomiting, or diarrhea. There was no toxicity from penicillin.

Ohio State Medical Journal, Columbus

47:297-392 (April) 1951

Therapeutic Team: Consideration of Collaborative Role of Doctor, Nurse, Attendant, and Family. J. L. Fetterman.—p. 321.
Acute Bacterial Endocarditis: Report of Case. J. C. Markley and E. B. Lefken.—p. 326.
Imperforate Anus and Atresia of Rectum: Report of Two Cases Treated by One Stage Abdominalperineal Reconstruction. F. M. Flickinger. —p. 329.
In Situ Carcinoma of Cervix. J. W. W. Epperson and J. M. McCord. —p. 333.
Diagnosis and Treatment of Sterility in Female. J. J. McDonough. —p. 336.
Transverse Presentation Treated by Cesarean Section. J. E. Morgan. —p. 341.

Physiological Reviews, Baltimore

31:107-204 (April) 1951

Intravascular Agglutination of Formed Elements of Blood. B. R. Lutz. —p. 107.
Mucoproteins in Relation to Virus Action. F. M. Burnet.—p. 131.
Fact and Theory Regarding Calorigenic Action of Adrenaline. F. R. Griffith Jr.—p. 151.
The Hepatic Artery. J. Markowitz and A. M. Rappaport.—p. 188.

Public Health Reports, Washington, D. C.

66:547-586 (May 4) 1951

Tuberculosis Mortality in the United States, 1949 (with Provisional Figures for First 11 Months of 1950). E. H. Halpin and O. D. Turner. —p. 547.
Experimental Error in Determination of Tuberculin Sensitivity. S. N. Meyer, A. Hougen and P. Edwards.—p. 561.
Atabrine Therapy of Histoplasma Infections in Mice. C. C. Campbell and S. Saslaw.—p. 570.

66:587-618 (May 11) 1951

Physical Status of Men Examined Through Selective Service in World War II. M. S. Goldstein.—p. 587.

66:619-654 (May 18) 1951

Activities of Medical Administrators in State Health Departments. H. M. Graning, M. Ferguson, B. A. Cheney and A. M. Leffingwell.—p. 619.
Nutrition and Control of Chronic Disease: Public Health Aspects. R. W. Vilter and C. Thompson.—p. 630.
Cultivating Community Relationships in Mental Health Program. H. L. Rooney.—p. 637.
*Influence of Irradiation and Penicillin on Experimental Syphilis Transmission. T. F. Probey.—p. 644.

Transmission of Syphilis by Transfusion.—Laboratory studies in experimental syphilis in rabbits have demonstrated that Treponema pallidum becomes avirulent and will not transmit syphilis when present in blood kept under blood bank conditions for 96 hr. or when in plasma processed to the dried state. Under these conditions blood from donors with syphilis should be acceptable for use. The hazard of transfusion syphilis may, therefore, be minimized by the routine processing of blood or blood products. However, the danger of transmission still exists in emergency transfusions with freshly drawn blood from syphilitic donors. In this event, a sterilizing agent, treponemicidal drug, or possibly irradiation would be required. The studies presented in this paper demonstrated that transmission of experimental syphilis in rabbits by transfusion was not prevented by previous exposure of whole blood containing virulent T. pallidum to ultraviolet irradiation, using the Oppenheimer-Levinson quartz chamber apparatus, or to crystalline penicillin G in large quantity, added one hour before transfusion.

South Dakota J. Med. & Pharmacy, Sioux Falls

4:77-94 (April) 1951. Partial Index

Why Test Visual Fields? P. J. Leinfelder.—p. 77.

4:95-132 (May) 1951

Malignancies of Spinal Cord and Peripheral Nerves. E. Sachs.—p. 95.
Choice of Kidney Incision. R. F. Livingston and W. L. Valk.—p. 100.
Rehabilitation of the Handicapped. T. F. Riggs.—p. 103.
Care of Poliomyelitis During Convalescent Period. W. H. Northway. —p. 105.
Pathology of New Growth of Thyroid Gland. F. C. Helwig.—p. 109.

Southern Medical Journal, Birmingham, Ala.

44:369-466 (May) 1951

Lipotropic Factors in Treatment of Cirrhosis: Evaluation by Biopsy and by Study of Phospholipid Turnover Employing Radioactive Phosphorus. J. O. Williams, D. Cayer and W. E. Cornatzer.—p. 369.
Construction of Artificial Vagina with 10 Year Follow-Up Studies. B. Word.—p. 375.
Transurethral Resection of Bladder Neck in Treatment of Congenital Abnormalities in Children. J. R. Rinker.—p. 382.
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Surgical Corrections of Vertical Heterotropias. C. T. Moran.—p. 396.
Surgical Significance of Cardiosplanchnic Reflex. D. W. Smith and M. A. Larkin.—p. 399.
Evaluation of Rapid Method of Cytologic Diagnosis in Suspected Skin Cancer. J. M. Hitch, T. B. Wilson and A. Scoggin.—p. 407.
Digitalis in Heart Disease. H. L. Clay Jr.—p. 414.
Effect of Digitalis and Other Drugs on Heart Contractile Force: Clinical Implications. R. P. Walton and P. C. Gazes.—p. 418.
Treatment of Coronary Artery Disease. W. N. Viar and T. R. Harrison. —p. 424.
Office Diagnosis and Treatment of Functional Uterine Bleeding. L. F. Turlington.—p. 429.
Problems of Prostate Gland. G. Carroll.—p. 432.
Treatment of Infantile Bowlegs and Knock Knees with Special Consideration of Therapeutic Use of Large Doses of Activated Ergosterol: Analysis of 58 Cases. H. D. Morris.—p. 435.
Physiologic Labor with Saddle-Block Anesthesia for Delivery. O. A Ellingson and R. H. Douglas.—p. 439.
Cooperation Between Organized Medicine and Public Health. N. H. Dyer. —p. 444.
Chemical Burns of Eye. R. S. McLaughlin.—p. 446.
Practical Therapeutics in Otolaryngology. W. C. Warren Jr.—p. 449.
Effect of Cortisone and ACTH on Bacterial Infections. M. Michael Jr. —p. 450.
Skin Cancer: One-Year Survey in Private Practice. J. G. Thompson. —p. 453.

Surgery, St. Louis

29:643-802 (May) 1951

Acute Pancreatitis and Pancreatic Injuries Following Subtotal Gastrectomy. K. W. Warren.—p. 643.
Partial Esophagectomy with End-to-End Anastomosis. E. B. Kay and K. L. Brown.—p. 658.
*Histopathology of Adenomatous Polyps of Colon and Rectum: With Special Emphasis on Relationship Between Adenoma and Carcinoma. H. E. Bacon, J. Laurens and A. R. Peale.—p. 663.
Pump-Oxygenator to Supplant Heart and Lungs for Brief Periods: I. Evaluation of Oxygenator Techniques; Efficient Oxygenator. K. E. Karlson, C. Dennis, D. Westover and D. Sanderson.—p. 678.
Id.: II. Method Applicable to Dogs. C. Dennis, K. E. Karlson, W. P. Eder and others.—p, 697.
Patent Ductus Arteriosus: Recurrence Following Ligation. C. B. Davis Jr., E. H. Fell and B. J. Gasul.—p. 714.
Growth of Vascular Anastomoses with Continuous Posterior and Interrupted Anterior Silk Sutures. J. Johnson, C. K. Kirby, M. W. Allam and W. Hagan.—p. 721.
Growth of Vena Cava and Aorta Grafts: Experimental Study. J. Johnson, C. K. Kirby, M. W. Allam and W. Hagan.—p. 726.
Melanocarcinoma of Plantar Surface of Foot: Review of 25 Cases. A. M. Decker and J. T. Chamness.—p. 731.
Use of Hyaluronic Acid for Fixation of Skin Grafts. H. H. LeVeen, E. Franklin and J. R. Barberio.—p. 743.
Invasive Infection Due to Genus Pseudomonas. C. W. Howe.—p. 748.
Aureomycin as Adjunct in Treatment of Major Burns. L. T. Wright, J. A. Tamerin, W. I. Metzger and A. L. Garnes.—p. 763.

Adenomatous Polyps of Colon and Rectum.—The origin, pathogenesis and histopathology of adenomatous polyps of the colon and rectum are reviewed. The relation between the benign adenoma and carcinoma is emphasized in this discussion. A pathological study was made of 800 cases of carcinoma of the large bowel. In 162 adenomatous lesions, there were 26 benign adenomas, 16 adenomas with atypia, 61 adenomata malignum or adenocarcinomas in situ, 24 grade 1 adenocarcinomas, five grade 2 adenocarcinomas definitely arising in an adenoma, and 30 polypoid papillary grade 2 adenocarcinomas. Of this series 90 (11.25%) showed definite histological evidence of having arisen in a benign adenomatous polyp, while 30 (3.75%) presented presumptive evidence of such origin. The criteria for the diagnosis of malignancy are presented, and the importance of the character of the epithelial cells is stressed. Close cooperation between the surgeon and the pathologist is urged for a better understanding of the proper management of this important group of neoplasms. Adequate surgical removal of certain polypoid lesions of the colon and rectum should be carried out, even if this requires radical resection in selected cases.

FOREIGN

Annales Paediatrici, Basel

176:297-360 (May) *1951*. **Partial Index**

*Insulin Therapy in Chorea Minor. E. Mayerhofer.—p. 297.
Adrenal Neuroblastoma: Report of Four Cases. E. Stransky and N. S. Felix.—p. 308.
Impairment of Liver in Toxicosis. O. Tezner.—p. 321.

Insulin Therapy of Chorea Minor.—In investigating the use of insulin in disorders other than diabetes, Mayerhofer studied muscular disorders, because muscle sugar in the form of glycogen is an important source of energy for the skeletal musculature. Two or three daily injections of from 3 to 7 units of insulin, while a lump of sugar was taken by mouth, together with a diet rich in carbohydrates acted favorably on the muscular unrest in the early phase of chorea. This calming effect appears so quickly, that is, after only a few days, that the author believes that it is not so much the result of local formation and storage of muscular glycogen but that it is rather brought about by a central, probably endocrine improvement in neurological regulation, which facilitates better coordination of muscular movements. It is also possible that both factors act synergistically. Although the efficacy of the insulin treatment in chorea minor cannot yet be fully explained, on the basis of experiences in 21 cases, the author recommends the practical application of the new therapy. It is at least as effective as the older therapeutic methods and, in many although not in all cases, it seems to be the best method. The insulin therapy in chorea is also of a certain theoretic interest. The author discusses muscular and particularly endocrine factors that might play a part in the etiology of chorea.

Beiträge zur klinischen Chirurgie, Munich

182:129-256 (No. 2) 1951. **Partial Index**

History of Local Anesthesia and Its Development into a Method of Treatment. D. Kulenkampff.—p. 129.
Percutaneous Arteriography of Brain and of Extremities with Iodopyracet Injection (Perabrodil®). T. Tiwisina.—p. 142.
*Significance of Parenterally Administered Amino Acids in Preoperative and Postoperative Management. H. H. Westermann.—p. 153.

Treatment with Intravenous Injections of Amino Acids.—Eleven patients with hypoproteinemia were subjected to a therapeutic trial with parenterally administered 10% elamine (purified casein hydrolysate) solution with dextrose, containing a standardized sterile mixture of amino acids. The patients were divided in three groups, one consisting of patients with preoperative and postoperative hypoproteinemia, the second consisting of surgical patients with undisturbed absorption of food in the presence of an unimpaired intestinal tract, and the third consisting of patients with disturbed absorption of food after surgical intervention on the stomach. The administration of amino acids is of greatest importance in patients with chronic suppurative wounds and in patients with disturbed absorption of food. The elamine solution was as a rule administered by infusion of 50 to 60 drops per minute. For prevention of untoward reactions, such as nausea, vomiting, sensation of heat, and headache, the infusion velocity may be reduced. Treatment with intravenously administered amino acids is contraindicated in patients with cardiac decompensation, severe liver insufficiency, or acidosis. Results in the author's patients showed that a positive nitrogen balance was obtained in most of the patients and the protein serum level was restored to normal in all. There was subjective and objective improvement of the general condition. In the course of 50 intravenous infusions of amino acids, 11 of which were given to a single patient, collapse occurred in only one patient with hydatid cysts in the pleura; it was probably due to an antigen-antibody reaction. Intravenous administration of amino acids should be limited to short preoperative treatment and to treatment during the first postoperative days. To prevent a drop in serum protein values after discontinuation of the intravenous therapy, oral or rectal administration of pulverized or dissolved amino acid mixtures is advisable during convalescence. The amino acid mixtures are more effective than blood transfusions in improving the serum protein level in patients with hypoproteinemia. Treatment with blood transfusions on the day of the surgical intervention to combat shock in patients subjected to extensive surgical interventions combined with subsequent intravenous and oral administration of amino acids appears to be most promising.

Brain, London

74:1-114 (March) (Part I) 1951

Surgical Treatment of Colloid Cyst of Third Ventricle: Report Based upon 21 Personal Cases. W. McKissock.—p. 1.
Effects of B. A. L. in Hepatolenticular Degeneration. J. N. Cumings.—p. 10.
Colloid Cysts of Third Ventricle: Analysis of 29 Cases. R. Kelly.—p. 23.
Corticofugal Connexions of Posterior Orbital Surface in Rhesus Monkey. P. D. Wall, P. Glees and J. F. Fulton.—p. 66.
*Nervous and Mental Disorders in Cushing's Syndrome. J. D. Spillane.—p. 72.
Hyaline Bodies in Optic Discs: Report of 10 Cases Exemplifying Importance in Neurological Diagnosis. J. W. Chambers and F. B. Walsh.—p. 95.

Nervous and Mental Disorders in Cushing's Syndrome.—Significant mental and/or neurological disturbances were observed in five of the seven patients with Cushing's syndrome that are reported on in this report. In one patient pituitary irradiation produced apparent clinical cure of the condition, but two years later progressive optic atrophy and cerebral atrophy set in. Four years after treatment the patient was blind, bedridden, and incontinent. Two patients were psychotic in the early stages of the disease. Another patient, who had much emotional instability and was in a neuropsychiatric center for several months, subsequently showed the physical signs of Cushing's syndrome. He also had an attack of unilateral retrobulbar neuritis, which left him with a permanent central scotoma. The fifth patient had considerable depression and alteration of personality in the first year of his illness. In reviewing the literature on the occurrence of nervous and mental disturbances in Cushing's syndrome, Spillane says that many reports do not mention the mental stage of the patient, but he lists 50 reported cases in which there was significant nervous and mental distress. Not included in this list are other cases in which minor symptoms, such as irritability, nervousness, insomnia, forgetfulness, shyness, feelings of self-consciousness and avoidance of social contacts, were the only nervous symptoms mentioned.

British Journal of Dermatology, London

63:*165*-202 (May) 1951

Tinea Capitis: Review of 1,004 Cases. J. M. Beare and E. A. Cheeseman.—p. 165.
Porokeratosis (Mibelli): Case with Extensive Lesions: Results of Animal Inoculation. J. Savage and H. Lederer.—p. 187.
Treatment of Warts with X-Rays: Is Their Action Physical or Psychological? F. F. Hellier.—p. 193.

British Journal of Industrial Medicine, London

8:53-116 (April) 1951

Role of Periodic Examination in Prevention of Coalworkers' Pneumoconiosis. A. L. Cochrane, C. M. Fletcher, J. C. Gilson and P. Hugh-Jones.—p. 53.
Action of Variable Amounts of Quartz on Lungs of Rats. Extent of Pathological Change in Relation to Amount Injected. S. C. Ray, E. J. King and C. V. Harrison.—p. 62.
*Action of Small Amounts of Quartz and Larger Amounts of Coal and Graphite on Lungs of Rats. S. C. Ray, E. J. King and C. V. Harrison.—p. 68.
Action of Anthracite and Bituminous Coal Dusts Mixed with Quartz on Lungs of Rats. S. C. Ray, E. J. King and C. V. Harrison.—p. 74.
Cardiovascular Disease in Cotton Workers: Part I. R. Schilling and N. Goodman.—p. 77.
Influenza Epidemic in Industry. A. L. Potter.—p. 91.
New Industrial Disease Called Hyperhidrosis Erythematosa Traumatica. J. H. T. Davies.—p. 95.

Action of Quartz plus Coal or Graphite on Lungs of Rats.—It is generally accepted that silica is the cause of silicosis, but it is not known to what degree nonsiliceous dusts assist or retard the silicotic process, when inhaled with silica. The effect of coal dust has been studied before, especially with reference

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The items in these letters are contributed by regular correspondents in the various foreign countries.

to its power to increase phagocytosis of siliceous dusts or to absorb the silica released in solution from such dusts. From such studies it had been concluded that inhalation of coal dust should lessen the pathogenicity of siliceous dusts. Many have believed that coal dust protects against silicosis. Others, however, reported cases of acute silicosis from the inhalation of coal dust, and they thought the coal probably hastened the action of the silica. Studies on rats reported in this paper revealed that pure coal dust gives rise to no serious reaction in the animal lungs. Much of it is eliminated, and the amount retained causes only slight reticulinosis. Small doses of quartz that alone produce no lesion in the rats' lungs produce nodular foci of reticulinosis when large amounts of coal dust are added. The large amount of coal probably upsets the drainage mechanism, and the silica retained in the lung exerts its toxic effect with the production of fibrous nodules. Pure graphite was as inert as pure coal, but fibrous nodules were produced when it was mixed with small amounts of silica. It is therefore concluded that the simultaneous presence of large amounts of coal or graphite exaggerated the pathogenic effects of small amounts of silica.

British Journal of Ophthalmology, London

35:189-252 (April) 1951. **Partial Index**

Retinal Micro-Aneurysms in Non-Diabetic Subject. N. Ashton.—p. 189.
Eosinophilic Granuloma of Orbit. A. J. Beller and W. Kornblueth.—p. 220.
Soemmering's Ring and Its Dislocations. G. S. Guha.—p. 226.
Folds in Lens Capsule After Trauma: Sign of Partial Rupture of Zonule. J. L. Bignell.—p. 234.
Adenoma of Limbal Conjunctiva. J. François and M. Rabaey.—p. 237.
Ophthalmomyiasis in England. R. Smith.—p. 242.
Marfan's Syndrome with Retinal Detachment. J. R. Hudson.—p. 244.

British Medical Journal, London

1:1095-1156 (May 19) 1951

Diet in Diabetes. C. C. Forsyth, T. W. G. Kinnear and D. M. Dunlop.—p. 1095.
"Priscol" in Treatment of Peripheral Vascular Disease. J. F. Goodwin and S. Kaplan.—p. 1102.
•Response of Megaloblastic Anaemia of Pregnancy to Crystalline Penicillin G. H. Foy, A. Kondi and A. Hargreaves.—p. 1108.
Clinical Significance of Vitamin-A Deficiency. Z. A. Leitner.—p. 1110.
Distribution of Anopheline Mosquito Bites Among Different Age Groups: New Factor in Malaria Epidemiology. R. C. Muirhead-Thomson.—p. 1114.
Blackwater Fever in African Children. D. B. Jelliffe.—p. 1117.
Laboratory Diagnosis of Urinary-Tract Infections: With Special Reference to Lactose-Fermenting Coliform Strains. J. B. Enticknap and B. J. Stephens.—p. 1119.

Megaloblastic Anemia and Crystalline Penicillin.—Foy and associates have previously described the favorable therapeutic effects of injections of penicillin G in a nonpregnant woman who had megaloblastic anemia and a histamine-fast achlorhydria. Now they report the use of this substance in a woman with megaloblastic anemia who was six months pregnant. She was given injections of 200,000 units of crystalline penicillin G (sodium salt) twice daily for 17 days. On the seventh day of penicillin treatment her reticulocytes rose to 26%, and there was an improvement in the red blood cell count and hemoglobin. When the injections of penicillin were stopped for about 10 days, the blood cell count remained unchanged or fell slightly. Then the injections were resumed, and, 19 days later, when the patient left the hospital, her erythrocyte count was 4,300,000 and the hemoglobin level 12 gm. The response was rapid, complete, and in every way similar to that obtained with liver, folic acid, and vitamin B_{12}. The marrow reverts to normal, the megaloblasts disappearing rapidly and the giant stab cells more slowly. It is suggested that this response to penicillin may be due to any or all of the following: (1) changes in the intestinal flora, which may lead to the destruction of antagonists or competitors, or other factors which may be interfering with the synthesis, absorption, or utilization of hemopoietic factors; (2) interference with bacterial metabolism, so that hemopoietic factors are released for the use of the body; (3) an effect on protein metabolism and the synthesis of nucleoproteins from basic amino acids; (4) the presence in penicillin of hitherto unknown hemopoietic factors, and (5) the destruction of toxins produced by bacteria.

Deutsche medizinische Wochenschrift, Stuttgart

76:661-692 (May 18) 1951. **Partial Index**

Ménière's Disease, Hemicrania and Vascular Innervation in the Region of the Head. P. Beickert.—p. 661.
Differential Diagnosis in Acute Infectious Lymphocytosis. E. Huth and H. Grunze.—p. 662.
•Criticism of Roentgen Diagnosis of Gastritis. A. Müller.—p. 664.
•Sensitization to Factors Other Than Those of the Rh-Group as Cause of Stillbirths: Kell Erythroblastosis. O. Prokop and F. Schleyer.—p. 665.
Experiences with Chediak's Microreaction in Examination of Cerebrospinal Fluid for Syphilis. E. Heinke.—p. 668.

Roentgen Diagnosis of Gastritis.—Müller asserts that gastroscopy frequently shows a normal gastric mucosa after a previous roentgenologic examination had disclosed changes indicative of gastritis. Comparative gastroscopic tests on 5,100 cases revealed that the roentgenologic diagnosis of gastritis was correct in only 61.7% of the cases. In a group of 1,200 cases the incidence of agreement was only 49%. On the basis of such results, the author denies that the roentgenologic demonstration of the relief configuration of the gastric mucosa is of value in the diagnosis of gastritis.

Kell Erythroblastosis.—Serologic investigations of recent years demonstrated that a significant number of formerly unexplained stillbirths could be traced to serologic incompatibility. The most widely known of these are those in the Rhesus system, but in the Lewis system and even in the classical ABO system of blood groups such serologic incompatibilities are also possible. Other factors have been discovered as the result of transfusion reactions, although they have not as yet been known to produce erythroblastosis. In this paper a case is reported in which the so-called Kell antigen was responsible for pregnancy toxicosis and death of a fetus.

Journal de Médecine de Lyon

32:447-510 (May 20) 1951. **Partial Index**

Transcerebral Iontophoresis of Calcium and Secondary Malignant Syndrome of Toxicosis. G. Mouriquand and N. Boulez.—p. 447.
Diffuse Osteopathies in Course of Septicemia in Nursing Infants. M. Bernheim, J. A. Roux and L. Gaillard.—p. 451.
•Brief Considerations on Treatment of 34 Patients with Tuberculous Meningitis in Children's Department of a Hospital, and Results Obtained. P. Bertoye, P. Monnet and J. Thivolet.—p. 457.

Treatment of Tuberculous Meningitis in Children.—Thirty-four children, eight of whom were nursing infants between the ages of 3 and 17 months, with tuberculous meningitis are reported on. Twelve of the 34 patients received streptomycin by the intramuscular route only. Six patients received in addition one course of 15 to 20 intrathecal injections of streptomycin. The remaining sixteen patients received streptomycin intramuscularly and, in addition, intrathecal injections, which were given either daily, to the rapidly deteriorating patients, or in repeated courses of 30 to 45 injections. There were 19 deaths. Recovery resulted in eight patients, seven of whom had been followed up for at least one year after the discontinuation of streptomycin. Six patients are still under treatment, with apparently highly favorable results in four and unsatisfactory results in two. One patient was lost sight of during the fifth month of apparently successful treatment. Only one of the eight nursing infants recovered. Familial contagion was observed in eight children, of whom six died; prognosis is uncertain in the two who survived. For better results with streptomycin therapy in tuberculous meningitis it seems imperative to continue the administration of streptomycin by intramuscular route for more than eight months with either daily injections or intermittent courses and to combine it with intrathecal injections for prolonged periods, until the cerebrospinal fluid has been restored to normal. Repeated courses of 30 to 45 intrathecal injections should be given if necessary. Because of the difficulties of the procedure prolonged hospitalization in a well-equipped hospital is required. Early diagnosis and, consequently, early treatment are of great importance. Diagnosis may be established by the demonstration of Koch's bacillus in the cerebrospinal fluid. Animal inoculation with the cerebrospinal fluid was carried out in 30 of the authors' cases, and positive results were obtained in 26. In the four other cases the diagnosis was established by associated signs and the course of the disease.

Journal Obst. & Gynaec. Brit. Empire, Manchester

58:165-372 (April) 1951. **Partial Index**

Origin of Lower Uterine Segment. W. Shaw and P. Nirula.—p. 165.
Iron Metabolism in Pregnancy: Behaviour of Haemoglobin, Serum Iron, Iron-Binding Capacity of Serum Proteins, Serum Copper and Free Erythrocyte Protoporphyrin in Normal Pregnancy. S. Ventura and A. Klopper.—p. 173.
Resuscitation of the Newborn. L. G. Higgins.—p. 190.
Endocrine Varieties of "Androblastoma" in Ovary and Testis. G. Teilum.—p. 201.
Radiological Pelvimetry and the General Practitioner. W. Hawksworth and E. P. Allen.—p. 203.
*Humoral Origin of Hypertension in Toxaemia of Pregnancy. A. D. T. Govan, C. L. Mukherjee, J. Hewitt and W. F. Harper.—p. 216.
*Chronic Endometritis. J. G. Dumoulin and P. E. Hughesdon.—p. 222.
Prematurity. D. J. Conway.—p. 236.
Acute Rheumatism in Pregnancy. L. I. M. Castleden, J. L. Hamilton-Paterson and E. ap I. Rosser.—p. 253.
Presentation and Prolapse of Umbilical Cord: Analysis of 350 Cases. E. Cope.—p. 259.
Venous Thrombosis During Pregnancy Treated with Dicoumarin. H. P. Wright.—p. 272.
Antenatal Thrombosis. J. L. Hallum and E. M. Newham.—p. 278.
Review of 100 Cases of Transplantation of Ureters in Treatment of Obstetrical Vesicovaginal Fistulae. P. G. Preston.—p. 282.

Hypertension in Toxemia of Pregnancy.—To determine whether all cases of hypertensive toxemia of pregnancy are of humoral origin and to discover whether the serum concentration of gonadotropins bears any relation to such an origin, the authors studied 140 women in the last trimester of pregnancy, all but 20 of whom had hypertension. Studies of serum gonadotropins, urea clearance, water excretion, and blood urea and the tetra-ethyl ammonium bromide reaction were made in the hypertensive patients. Four patients who had essential hypertension had a low serum concentration of gonadotropins, a normal rate of water excretion and did not react to tetra-ethyl ammonium bromide. The others had hypertensive toxemia and formed two groups on the basis of the above tests. The majority had a high serum concentration of gonadotropins, a diminished rate of water excretion, and no reaction to tetra-ethyl ammonium bromide. A small number had a low serum concentration of gonadotropins, a diminished rate of water excretion, and a reaction to tetra-ethyl ammonium bromide comparable to that seen in normal pregnant patients. It is suggested that in most cases of hypertensive toxemia the hypertension is of humoral origin and is related to hyperfunction of the anterior pituitary.

Chronic Endometritis.—At the turn of the century "chronic endometritis" was a convenient diagnostic label for all cases of excessive or painful uterine bleeding not due to neoplasm and a rationale for their treatment by curettage. It was divided into a glandular type with a thick and hyperplastic mucosa, an interstitial type with stromal inflammatory cells, and various combinations and subdivisions. This concept was discredited when the endometrial cycle was described in 1907. At this time "glandular endometritis" was recognized as a normal stage in the development of the premenstrual endometrium. The diagnosis of interstitial endometritis was retained, however, being restricted to the minority of cases showing plasma cells. The authors review the controversy that arose with regard to the importance of plasma cells in the diagnosis of endometritis. Many writers claim that a persisting primary endometritis is never found, either because a large part of the endometrium is shed each month, or, failing this, because the menstrual flow and vertical position of the uterus provide excellent drainage. Only Schröder seems to believe that infection may persist in the basalis and continue to reinfect the functionalis. Among the conditions with which chronic endometritis is associated, tubal infection is held to be the commonest; others include abortion, uterine polyps, sloughing submucous tumors, recent instrumentation, foreign bodies, cervical stenosis, and, doubtfully, chronic cervicitis. Dumoulin and Hughesdon investigated whether one of these conditions is present when some or many endometrial plasma cells are found, and how reliable the finding of plasma cells is as a guide to the presence of adnexitis, if the uterine causes of endometritis can be excluded. The endometria of 1,240 patients were sectioned, and 66 (5.3%) contained plasma cells. Profuse and/or irregular bleeding was the most frequent symptom; less common were pain, discharge, and infertility. Etiological factors in the form of adnexitis, recent pregnancy, or miscellaneous uterine conditions were found in 42 of the 64 cases, and in 30 of the 34 severest cases, i. e., with more than 10 plasma cells per high-power field. In 22 patients no cause could be found, and some of these apparently had an isolated endometritis. The current view that this does not occur is baseless. Severe endometritis, however, probably does not occur alone; its diagnosis is, therefore, of value, and should be used as an indicator of associated disease. As endometrial pathology has not yet caught up with symptomatology, a known gap in our knowledge, such as isolated endometritis, merits further study.

Strahlentherapie, Berlin

84:481-622 (No. 4) 1951. **Partial Index**

Histochemical and Serologic Investigations on Action of Roentgen Rays. T. Hornykiewytsch and G. Seydl.—p. 489.
*Intrauterine Radium Irradiation of Carcinoma of Corpus Uteri at Women's Clinic in Göttingen. H. Czech.—p. 524.
Irradiation of Cancer of Esophagus. E. Günsel.—p. 548.
Small Doses of Roentgen Rays in Irradiation of Inflammatory Processes. H. Strauss.—p. 554.
*Irradiation Therapy in Hypertension. B. Wolf.—p. 559.
Action of Radium Rays on Growing Human Bone. A. L. Meier.—p. 587.
Action Mechanism of Biologic Reactions of Ultrasonics. O. A. Angerer, G. Barth and W. Güttner.—p. 601.

Intrauterine Radium Irradiation of Corpus Carcinoma.—Czech regards the intrauterine introduction of radium as the most important part of irradiation therapy of carcinoma of the body of the uterus, since women in his clinic who received additional percutaneous roentgen irradiation fared no better than those who had received only intrauterine radium therapy. Because it is difficult to ascertain the exact location of the carcinoma within the uterus, triangular, bucket-shaped, and Y-shaped applicators have been used for better spatial distribution of the radium dosage than is possible with a single rod-shaped holder. The author prefers a packing method in which the uterus is packed with a number of small cylindrical holders of nickel-plated brass, with a top that can be screwed on and off and a loop through which a numbered thread is passed. The continuous numbering makes it possible to follow a certain sequence during the introduction and withdrawal of the holders. A platinum tube, 15 cm. in length with a wall-thickness of 0.3 mm. and holding 10 mg. of radium, is placed into each of the brass holders. A uterus of normal size, having a depth of about 8 cm., is packed with about 12 such holders, larger uteri with up to 20 holders. Measurements on wax phantoms revealed the differences in dosage distribution when one rod-shaped radium holder is introduced and when the uterus is packed with the aforementioned small holders. Dosage problems arising from the close proximity of bladder and intestine to the irradiated uterus are also considered.

Irradiation Therapy in Hypertension.—The results obtained in hypertensive patients with sympathectomy induced Wolf to apply roentgen irradiation to the ganglions of the thoracic sympathetic chain. He applied the rays with a focus-skin distance of 30 cm. to a field 10 by 15 cm. corresponding to the fifth to the 12th thoracic vertebrae, giving a surface dose of 40% of a unit skin dose and a focal dose of 20% of a unit skin dose. The technique used was as follows: 200 kv., 15 ma., 1 mm. Cu, half-value layer 1.5 mm. Cu, and unit skin dose 760 r. Most patients were given first a series of three irradiations at intervals of one or two weeks. Depending on the reaction, additional irradiations were given after six to eight weeks. A total of 34 hypertensive patients were treated, and many of them have been kept under observation for two years. The effects of the irradiation differed in the various forms of hypertension. In seven patients, with so-called pale hypertension, improvement was still not evident after a second series of irradiations. In the other patients a wavelike decrease was noticeable after two to four weeks. On the whole, results were satisfactory. In five patients in whom irradiation of thoracic sympathetic ganglions produced no great improvement, irradiation of the region of the diencephalon was also unsuccessful. The favorable results of irradiation of the sympathetic chain were still evident after 22 months in 12 of 20 patients. Improvement was noticeable particularly in the subjective condition of the patients.

Ugeskrift for Laeger, Copenhagen

113:407-442 (April 5) 1951. Partial Index

*Pheochromocytoma and Its Diagnosis. Review. J. Riishede.—p. 407.
*Benzodioxan Test in Pheochromocytoma. M. Faber.—p. 413.
Case of Pheochromocytoma in Child. P. Bastrup-Madsen.—p. 420.
Thrombopenic Purpura After Quinidine Sulfate. A. Pinholt Andreasen and R. Christensen.—p. 422.

Diagnosis of Pheochromocytoma. Review.—The increasing number of cases of pheochromocytoma reported during recent years, Riishede says, and the occurrence of two cases in the neurosurgical department of Aarhus Hospital and five cases in nearby hospitals suggest that this usually curable cause of hypertension is not so uncommon as formerly supposed. About 90% of the cases described in the literature developed from the adrenal glands. Endocrine activity seems to be especially pronounced in the tumors localized to the adrenals. The cardinal symptom of the pheochromocytoma is hypertension, which most characteristically is paroxysmal. The disease is thought to pass through the following stages: paroxysmal hypertension alternating with normal blood pressure and increasingly frequent attacks, permanent hypertension with paroxysmal aggravation, and permanent hypertension without characteristic paroxysms. After the intermittent course diagnosis is often impossible. Pharmacologic tests may be helpful in the diagnosis of pheochromocytoma. Of the tests designed to stimulate the discharge of pressor compounds from the tumor and reproduce symptomatic attacks the histamine test is considered the best, but it may be hazardous. The piperoxan (benzodioxan) and dibenamine® (N,N-dibenzyl-beta-chloroethylamine hydrochloride) tests are designed to lower the blood pressure by competitive inhibition of the pressor compounds secreted by the tumor. Abdominal exploration may be necessary. The only method of treatment of pheochromocytoma is operative removal.

Piperoxan Test in Pheochromocytoma.—Faber recommends the piperoxan (benzodioxan) test as a reasonably reliable test for the presence of pheochromocytoma with persisting hypertension. The test is advised first and foremost in all cases of hypertension with symptoms of paroxysmal attacks, also in cases in which the family history gives no information on the occurrence of hypertension. Some form of pharmacologic pheochromocytoma test is advised in every young hypertensive patient without demonstrable renal affection, as a positive outcome in most cases indicates that curative treatment is possible. Pheochromocytoma appears to occur most commonly between the ages of 20 and 50, but cases with symptoms have been reported in patients aged up to 72. Two cases of operatively verified pheochromocytoma are described, in one of which the piperoxan test was negative. Explanations for the negative outcome are suggested.

113:443-472 (April 12) 1951

*Intoxication on Therapeutic Application of Acetylsalicylic Acid in Infants and Small Children with Colds or Pneumonia. T. Iversen and E. Schiødt.—p. 443.
Fibrous Dysplasia of Bones. K. Lundbaek and R. Olsen.—p. 455.

Intoxication on Therapeutic Application of Aspirin in Infants and Young Children.—Iversen and Schiødt discuss the symptoms of acetylsalicylic acid (aspirin) poisoning in young children on the basis of 39 cases from the literature and their four personal cases, in two of which bronchopneumonia was complicated with acetylsalicylic acid intoxication. The main symptom, they find, is hyperpnea. The patient is usually dehydrated, may be apathetic and delirious, and in grave cases coma and shock dominate. There are changes in the acid-base balance, and the electrocardiogram shows prolongation of ventricular systole. In differential diagnosis, pneumonia, myocarditis, sepsis, and diseases causing acidosis are mainly to be considered. Treatment consists of the administration of 0.9% sodium chloride and 5% glucose; 1.3% sodium biocarbonate should always be given, subcutaneously or intramuscularly, but in small doses, during the first stage of the intoxication. The authors assert that acetylsalicylic acid should not be given in the first years of life, cautioning particularly against its application in suspected or proved pneumonia.

Wiener klinische Wochenschrift, Vienna

63:301-320 (April 27) 1951. Partial Index

Functional Improper Posture with Secondary Myalgia and Improper Posture Resulting from Myalgia. A. Saxl.—p. 301.
Goiter in Young Persons. H. Steiner.—p. 303.
*Experiences with Treatment of Hemolytic Disease of Newborn Infants by Exchange Transfusions or Blood Transfusions. H. Kölbl.—p. 307.

Treatment of Hemolytic Disease of Newborn Infants.—Of 34 newborn infants, 25 boys and nine girls, with severe jaundice, 19 were treated by repeated blood transfusions and 15 by exchange transfusions. Rh incompatibility was present in 32 infants, and A-B-O isoimmunization in two. Transfusions are indicated when the erythrocyte counts reveal a rapid drop below 3,000,000. Rapid deterioration of the clinical picture, the occurrence of cutaneous hemorrhage as a sign of capillary damage, the early occurrence of severe jaundice within the first 12 hr. after delivery and a positive reaction to Coombs' test are decisive criteria for the administration of exchange transfusions. The number of the erythroblasts in the peripheral blood is not decisive. Wiener's cumbersome technique of exchange transfusion was used in only one instance, and the Diamond technique or the modified Gasser technique were preferred by the author. In cases in which the umbilical vein was thrombosed, a polyvinyl catheter was introduced into the saphenous vein and pushed forward to the inferior vena cava, thus facilitating a rapid exchange of blood. About 500 to 700 cc. of blood is required for the largest possible exchange of the blocked erythrocytes of the infant. The author cautions against the use of Rh positive blood for exchange transfusions, since this may produce increased hemolysis, increased bilirubinemia, lower nephron nephrosis, and a rapid and enormous increase of the nonprotein nitrogen values, resulting eventually in death. Thirteen of the 34 infants had kernicterus; four of them were treated by exchange transfusion and nine by repeated blood transfusion. Six of the 13 died. The transfusion therapy has no effect on the kernicterus, which is present at birth. Transfusion treatment is not lifesaving, since danger to life depends on the kernicterus rather than on the anemia. Rh or A-B-O incompatability between mother and infant is not a contraindication to breast feeding.

63:357-372 (May 18) 1951. Partial Index

*Fall of Circulating Eosinophils Following Administration of Epinephrine. H. Braunsteiner, F. Pakesch and H. Vetter.—p. 359.
Antihistamine Preparation Used as Prophylactic in Burns. T. Wense.—p. 362.
Nailing of Pertrochanteric Fractures of Femur. G. H. Marcus.—p. 363.

Fall of Circulating Eosinophils After Administration of Epinephrine.—The fall of circulating eosinophils after the intramuscular injection of 0.3 mg. of epinephrine and the usefulness of this phenomenon as a test for adrenal cortex deficiency was studied in 114 persons. This group included eight patients with a clinical diagnosis of adrenal cortex deficiency, 60 persons who were normal or slightly ill without clinical signs of adrenal cortex deficiency, 20 patients with moderately severe disease, and 26 who were chronically ill. Initial eosinophil counts varied from less than 80 to more than 4,000 cells per cubic millimeter. Results showed that the absence of a 30% or more fall in circulating eosinophils within four hours after the administration of epinephrine on repeated examination presents a highly probable but not infallible indication for adrenal cortex deficiency. The reliability of the test may be impaired by extremely low or high initial eosinophil counts and by chronic diseases. Six of the eight patients with a clinical diagnosis of adrenal cortex deficiency had Addison's disease, for which they had not been treated, and five of these showed a fall in eosinophils of less than 40%. Results of tests of patients with clinically latent or mild adrenal cortex deficiency were not conclusive. Additional experiments showed that *l*-nor-epinephrine has no eosinopenic action, while ephedrine induces a more than 50% fall of eosinophils. The fall of eosinophils after the administration of epinephrine could not be inhibited significantly by sympathicolytic drugs such as N,N-dibenzyl-beta-chloroethylamine (dibenamine®) and dihydroergotamine, or by barbituric acid derivatives, massive doses of desoxycorticosterone or progesterone.

BOOK REVIEWS

Toxicology of Uranium: Survey and Collected Papers. Edited by Albert Tannenbaum, M.D., Director, Department of Cancer Research, Medical Research Institute, Michael Reese Hospital, Chicago. National Nuclear Energy Series, Manhattan Project Technical Section, Division IV—Plutonium Project Record, Volume 23. Cloth. $3. Pp. 333, with illustrations. McGraw-Hill Book Company, Inc., 330 W. 42d St., New York 18; Aldwych House, Aldwych, London, W.C.2, 1951.

A continuation of the long series planned by the United States Atomic Energy Commission, this volume contains reports of animal experiments conducted between 1942 and 1946 on the effects of ingestion and injection of uranium compounds. This work was undertaken because of the need of protecting the many technical workers engaged in the development and production of atomic bombs.

The book is very well written, has a good index, and in general is so designed that it will be exceedingly useful to anyone doing research in the future in this particular field. Material of special interest abounds; an example is the description (pages 274 to 282) of a microfluorometric method capable of determining quantitatively as little as 0.0001 microgram of uranium. The book is naturally not of immediate interest in the practice of medicine but deserves commendation as a most substantial contribution to medical science.

Lehrbuch der Röntgendagnostik. 2.-4. Lieferungen: Skelett. Von H. R. Schinz, W. E. Baensch, E. Friedl und E. Uehlinger. Nebst Beiträgen von E. Brandenberger, et al. Fifth edition. Paper. 70 marks; 82 marks; 84 marks. Pp. 427-878, with 764 illustrations; 879-1406, with 732 illustrations; 1407-1920, with 674 illustrations. Georg Thieme Verlag, Diemershaldenstrasse 47, (14a) Stuttgart O; agents for U. S. A.: Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1950; 1951.

The review of Section 1 appeared in THE JOURNAL Nov. 4, 1950. Sections 2, 3, and 4 are concerned with the skeleton.

Section 2 deals with aseptic necrosis, toxic lesions of bone, inflammatory diseases of bone, certain of the hereditary skeletal defects, and some of the primary neoplasms. One may argue with the validity of listing Paget's disease and Caffey's disease as "inflammatory," but a completely logical classification does not exist, unless one employs a "catch-all" group of diseases of "unknown etiology."

The first 53 pages of Section 3 continue and conclude the consideration of primary malignant neoplasms and are followed by 35 pages on skeletal metastases. The discussion of skeletal anomalies begins with a consideration of the roles played by genetics and by disturbances of physiology of the developing fetus, followed by the generalized anomalies of twins and then of single fetuses. The portion on hypervitaminosis and hypovitaminosis is noteworthy, particularly for the illustrations of severe rickets involving extremities and the sternal ends of the ribs—the so-called rachitic rosary.

The section on disturbances of growth and maturation deals with the various types of dwarfism and gigantism, and under the caption "Hormonal Diseases of Bone" the authors discuss the skeletal results of disturbances of the pituitary, parathyroids, adrenals, ovaries, testes, thyroid, and pancreas. Included, also, are certain forms of osteoporosis, osteosclerosis, and fibrous dysplasia suspected of having a hormonal basis.

The section devoted to joint diseases begins with a protracted discussion of a procedure that has met with little favor in the United States, namely, the direct demonstration of the capsule by injection of positive or negative contrast media—so-called arteriography. Dislocation with and without fracture are well illustrated, and there are included here certain types of fractures that occur in epileptics and in patients subjected to shock therapy.

Arthritis is classified and described in the conventional manner but with the addition of several of the rarely encountered special forms of chronic arthritis. Thirty pages are devoted to hereditary lesions of joints, and here, surprisingly, one finds gout.

Section 4 is devoted to the various diseases of the spine, the skull, muscles, tendons, subcutaneous tissue, blood vessels, breast and the salivary glands, and the localization of foreign bodies. Finally, there are 60 pages of charts, tables, legends, and sketches epitomizing the differential diagnosis of skeletal lesions.

It is only natural that in all three sections the authors have drawn largely on the rich German literature for their text and illustrations, but when they do refer to American work their references usually are to textbooks and secondary publications rather than to basic sources in experimental medicine, surgery, and pathology. Presumably an index will be supplied when all sections of the 5th edition have been published, but the individual sections would have been even more useful than they are at present if each could have had its own separate index, pending the appearance of the cumulative index.

The excellence foreshadowed in Section 1 is continued in sections 2, 3, and 4 and presumably will continue in the numerous sections to follow. These books are a source of complete, authentic, and well illustrated information on specific problems in x-ray diagnosis.

The Enzymes: Chemistry and Mechanism of Action. Volume I, Parts 1 and 2. Edited by James B. Sumner and Karl Myrbäck. Cloth. $13.50; $12.80. Pp. 724; 725-1361, with illustrations. Academic Press, Inc., 125 E. 23rd St., New York 10, 1950; 1951.

Many advances have been made in enzymology in the last several years, and the problems now encountered are of interest to scientists in various fields. Although enzymes originally may have been of interest principally to the biochemist, they have become the subject of study in all the biological sciences as well as the fields of organic and physical chemistry.

In order to evaluate properly the progress made and at the same time point out the many problems still to be investigated, it was desirable to bring together in a comprehensive survey the work that has been done in the enzyme field. This was the thought in mind in the planning of this two-volume series on enzymes, which will be published in four parts. The various aspects of enzymology will be covered by some 87 authorities from Australia, Europe, and the United States.

Part 1 of Volume I contains an introductory chapter by the co-editors of this series. It contains several generalities concerning enzymes, such as their chemical nature, general properties, and the determination of their activity, as well as the definitions, terminology, and classification commonly used in enzyme chemistry. Chapters 2 through 8 deal with certain chemical or physical aspects of enzymes which may be considered to be held more or less in common by all of them. Kinetics, specificity, adaptation, inhibition, and also the role enzymes play in immunochemistry and chemotherapy and their relation to cell chemistry, viruses, hormones, and vitamins are discussed. Chapters 9 through 19 include specific enzymes or groups of enzymes. Among these are the fat and ester hydrolyzing enzymes, cholinesterase and acetylcholinesterase, phosphatases, sulfatases, alpha-D-glucosidases, and beta-glucosidases and other sugar-splitting enzymes, amylases, beta-glucuronidase and invertase.

Part 2 of Volume I is a continuation of the study of the various specific enzymes or enzyme groups. It contains 24 chapters dealing with enzyme groups, such as the cellulases, desulfhydrases, mucopolysaccharases, phosphorylases, transaminases, and transmethylases, and the specific enzymes: carbonic anhydrase, aspartase, fumarase, aconitase, enolase, thiaminase, penicillinase, histidase, urocanase, hippuricase, allantoinase, allantoicase, arginase, and urease. Other class enzymes discussed are the pectic, proteolytic, and nucleolytic enzymes. The role of enzymes in blood and milk coagulation as well as their presence in bacterial and animal toxins are also included.

Since each chapter is prepared by a different authority, the organization of the chapters and the material discussed at length differ considerably. Overlapping and repetition, which might be expected in a book prepared by 87 authors, appear to be minimal.

The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

Each chapter has appropriate references, including material as recent as 1950. It has been impossible to include in detail everything that is available; however, some procedures are included where they appear necessary. Part 2 contains the author and subject indexes for both parts of the volume. The series can almost be considered a must for workers or prospective workers in enzymology, whether they are in the medical field, in organic or physical chemistry, biochemistry, zoology, bacteriology, or in any of the other divisions of the biological sciences.

Climate in Everyday Life. By C. E. P. Brooks, I.S.O., D.Sc., F.R.Met. Soc. Cloth. $4.75. Pp. 314, with 34 illustrations. Philosophical Library, Inc, 15 E. 40th St., New York 16, 1951.

From the rich and numerous but widely scattered sources of information on climatology, Brooks first assembled facts for a lecture on climate and the deterioration of materials; this grew into a book on industrial climatology, and finally became the present even more inclusive volume. Its three major divisions are headed "Living with the Climate," "Climate as an Enemy," and "The Control of Climate." The third is of particular medical interest because it includes discussions of heating, air conditioning, lighting, and clothing. Readers curious about the new word "clo" will find a definition on page 254. The surprising integrations of modern life are exemplified on page 252, where the author notes the increased drain on the electric generator systems when a dense thundercloud darkens the sky over a great city. The author's discussion of lighting is far from complete, and in general it becomes evident that the subject of climatology, even in its purely medical aspects, has grown to the point where it can no longer be covered in detail in a volume of this size. Nevertheless, the author deserves credit for having produced a work that is replete with both information and inspiration.

Essentials of Nutrition. By Henry C. Sherman and Caroline Sherman Lanford. Third edition. Cloth. $4.25. Pp. 454, with 36 illustrations. The Macmillan Company, 60 5th Ave., New York 11, 1951.

The newest edition of this popular textbook has been brought up to date and revised in the light of our rapidly expanding knowledge of the science of nutrition. All the data on the nutrient content of foods have been revised to conform to the governmental publication of June, 1950. The authors have not merely added new sections to the different chapters but have completely rewritten them, incorporating the results of recent nutritional research. The bibliography at the end of each chapter has been expanded to include references to basic nutritional research performed since the previous 1943 edition. There is a short discussion of the newer specific factors for calculating the caloric values of foods, and a table in the appendix gives a comparison of these values with those arrived at by the commonly used Atwater factors. Examples of the long-term benefits to be derived from the liberal intake of calcium and vitamin C are also cited. As the authors say in the preface, ". . . today's essentials of nutrition deal with potentialities beyond those that the science of yesterday thought possible."

This book can be highly recommended for use in the teaching of nutrition courses in colleges and nursing schools, and any person who desires a brief comprehensive survey of the field of nutrition will find it of particular value.

Medicinal Chemistry. Volume (E.S.) I. C. M. Suter, Editor-in-Chief. Series of reviews prepared under auspices of Division of Medicinal Chemistry of American Chemical Society. Cloth. $12. Pp. 473. John Wiley & Sons, Inc., 440 4th Ave., New York 16; Chapman & Hall, Ltd., 37-39 Essex St., Strand, London, W.C.2, 1951.

This is the first of a series of volumes sponsored by the Division of Medicinal Chemistry of the American Chemical Society. The stated purpose of the series is "to summarize the available data on the biological properties of medicinal substances and to correlate the relationship between chemical structure and physiological activity in each area covered."

The areas covered in this volume are antithyroid compounds, antispasmodics, antibiotics from plants, benzoates and substituted benzoates as local anesthetics, and analgesics divided into the aralkylamines and partial structures related to morphine. The same general plan is followed for each topic: lists of all compounds that have been tested for a given pharmacological activity, relationship between chemical structure and pharmacological action, brief discussion of methods of synthesis and pharmacological test methods, and inclusion of an extensive bibliography, including references to patents.

There are a great number of tables comparing the activities of numerous compounds organized according to chemical structure. The authors are industrial research workers active in the fields about which they write. The work meets a great need among chemists and pharmacologists who synthesize and evaluate drugs.

Pain and Its Problems. Edited by Sir Heneage Ogilvie, K.B.E., D.M., M.CH., and William A. R. Thomson, M.D. Practitioner Handbooks. Cloth. $3. Pp. 194. The Blakiston Company (Division of Doubleday & Company, Inc.), 1012 Walnut St., Philadelphia 5, 1950.

This is a compilation by various authors of their original short review articles which appeared in *The Practitioner*, plus certain additional chapters. It is by far the best available small monograph on clinical pain. Certain subjects, such as headache, are sketchily disposed of, but the treatment of other types of clinical pain is more than adequate. The two chapters on the drug treatment of pain can be criticized for the use of such typical British drug names as pethidine (meperidine) and omnopon. A few explanatory footnotes might have made the American edition more useful for those practitioners who are unfamiliar with British drug names.

Patterns of Sexual Behavior. By Clellan S. Ford, Ph.D., Associate Professor of Anthropology, Yale University, New Haven, and Frank A. Beach, Ph.D., Professor of Psychology, Yale University, New Haven. With foreword by Robert Latou Dickinson, M.D. Cloth. $4.50. Pp. 307, with 16 illustrations. Paul B. Hoeber, Inc. (Medical Book Department of Harper & Brothers), 49 E. 33d St., New York 16, 1951.

Development of serious interest in the problem of sex education and how it may be carried out most successfully make this volume especially desirable, because all too often those attempting to provide such education have little or no knowledge regarding the evolution of sex behavior in man. The authors have made a survey that includes American society, 190 other peoples, and several groups of animals in the same subclass of mammals. The recognition that there is an extremely wide variation in attitudes regarding sexual behavior could conceivably have a salutary effect on the way in which some sex educators approach their task. The nature of coitus, sexual attractiveness and stimulation, homosexual behavior, and physiological factors in sex behavior are developed in 12 chapters, with a final summary chapter. A glossary and an extensive bibliography are also included.

Advances in Enzymology and Related Subjects of Biochemistry. Volume XI. Edited by F. F. Nord. Cloth. $9. Pp. 471, with illustrations. Interscience Publishers, Inc., 250 5th Ave., New York 1; Interscience Publishers, Ltd., 2a Southampton Row, London, W.C.1, 1951.

As in the other volumes in this series, there are reviews by experts of recent advances in various fields of biochemistry related to enzymes. Thus there are chapters on the biochemical role of entropy by Gutfreund, on reactions at interfaces (including information on toxicity of ions, oxidation of sterols, and action of snake venoms on surface films) by Danielli and Davies, on chlorophyll by Wassink, on pectic enzymes by Lineweaver and Jansen, on transformations of starch by Peat, on alliin (including a short discussion on possible use in therapy) by Stoll and Seebeck, and on wilting in plants by Gäumann. Of most interest to medical scientists, though, are the chapters on the thiol groups of biological importance by Barron of the Chemical Division, Department of Medicine, University of Chicago, and on enzymic synthesis of polysaccharides by Hehre of the department of bacteriology and immunology, Cornell University Medical College. The indexes to this volume are supplemented by a cumulative author index to the series. The printing and binding are excellent.

QUERIES AND MINOR NOTES

EFFECTS OF SECONDARY X-RADIATION

To the Editor:—*I perform on the average of four retrograde pyelograms a week. I use a standard urological table, stand at the foot of the table to inject the contrast media, and remain there during a second and sometimes a third exposure. The tube is a CRT 1-2 Coolidge X-ray Tube Unit. My questions concern the effects of secondary x-radiation that one would be exposed to in the use of this particular tube. Is there a possibility of radiation sterility or other detrimental x-radiation effects? There is no cone or filter on our tube, and we use the small focal spot.*

M.D., Florida.

Answer.—The dosage rate of primary and scattered radiation received by the operator depends on the kilovoltage, milliamperage, and time factors employed, as well as the individual output characteristics of his particular x-ray tube in its housing and the location in which it is used. It also depends on the distance the operator maintains from the x-ray tube, the patient, and the cassette during the exposure. The dosage rate the operator receives should therefore be checked by an instrument that measures ionizing radiations. Such a service can undoubtedly be obtained from the manufacturer of the equipment the operator uses; it is suggested that he communicate with the company's representative or arrange for some qualified person in his locality to measure the radiation in question. The possibility of detrimental effects can only be evaluated after the dosage and an estimate of the quality of the radiation are known. The problems should not be neglected.

It is also suggested that a suitable cone and filter be employed for the protection of both the patient and the operator against unnecessary exposure to ionizing radiations and so that better roentgenographic definition may be obtained.

INFECTIOUS HEPATITIS AND "SPLIT EYE"

To the Editor:—*Is there any relation between infectious hepatitis in humans and "split eye" in poultry, characterized by enlarged liver and transmitted by the droppings from one chicken to another? Infectious hepatitis recently developed in two elderly patients; they eat three to four dozen eggs a week from their own flock. A case of "split eye" was detected in their flock two months before the first case. The second case developed almost exactly 60 days after the first one.*

Arnold C. Tait, M.D., Sunnyside, Wash.

Answer.—Infectious hepatitis of human beings appears unrelated to the various expressions of the avian leukosis complex (ALC), of which ocular lymphomatosis, also occasionally called "split eye," is considered a part. While both diseases are attributed to virus agents, the properties of each agent and disease are distinctive and divergent. Ocular lymphomatosis is characterized by mononuclear cell infiltration, which is apparent chiefly in the iris. This expression of the ALC may be accompanied by hepatolymphomatosis, which, in turn, may be manifested by slight to massive lymphomatosis of the involved organ and is similarly due to an oncogenic agent. Concentric annular or spotty depigmentation or diffuse bluish gray fading of the iris, in one or both eyes, commonly results. The pupil may become irregular with angular indentations ("split eye") and gradual loss of light accommodation. The iris, in advanced cases, is diffusely gray with pinpoint pupil. Slightly turbid exudate collecting in the anterior chamber tends to increase the convexity of the cornea as in glaucoma.

Havens and Paul (in Rivers, Viral and Rickettsial Infections of Man, Philadelphia, J. B. Lippincott Company, 1948) emphasize the characteristic diffuse involvement of the liver in infectious hepatitis in man. There is early and diffuse parenchymal destruction of this organ in contrast to the chronic, largely noninflammatory cellular infiltration that typifies the classic ocular lymphomatosis of domestic fowl and other birds.

HORMONAL BALANCE OF PREGNANCY AND THE MENOPAUSE

To the Editor:—*In women, either during pregnancy or the menopause, occasionally bright red capillary nevi, 1 or 2 mm. in size, develop on the chest, breast, and upper abdomen, sometimes accompanied by moist red palms and painful, fissured pale tongue. What hormonal imbalance, if any, do these women have in common? Is there any connection between protein and liver metabolism, vitamin B deficiency, low estrogen, and high circulating levels of follicle-stimulating hormone? These are not the usual "spider nevi," and none of these women have cirrhosis or alcoholism.*

M.D., Massachusetts.

Answer.—The hormonal balance of pregnancy differs greatly from that of the menopause; in the latter there is a deficiency of estrogen. During pregnancy large amounts of estrogens circulate in the blood and are present in the tissues of the body; in addition, there are unusually large amounts of progesterone as indicated by pregnandiol excretion as well as the high titers of chorionic gonadotropin, which are the basis for many of the pregnancy tests depending on ovarian stimulation in animals. It is therefore highly doubtful that the capillary changes and the fissured tongue have a common endocrine etiology. However, in a deficiency of estrogen, such as occurs in the menopause, capillaries are more fragile. Fissuring of the tongue has little or no relation to estrogen deficiency, although it is known that the mucosa of the mouth and nose may undergo a degree of atrophy in the presence of estrogen deficiency. Whether this may be reflected in changes in the tongue epithelium is not well established. There is little physiological basis for an explanation of such changes during pregnancy. There are typical epithelial changes during pregnancy, such as hypertrophy of the gums, herpes, and petechia, but it is difficult to correlate these changes and those mentioned in the question.

There is a definite relation between liver metabolism and the estrogens. When the liver functions poorly because of organic lesions, protein deficiency, or a vitamin B deficiency estrogens are not destroyed normally, with a resultant increase in circulating estrogenic hormones. This should result in a low level of follicle-stimulating secretion by the anterior pituitary. In long-standing liver diseases, capillary disturbances may appear, and these are possibly due to excessive estrogen over a long period of time. It is doubtful that this situation occurs during pregnancy because of the elevated titers of estrogen.

ASTIGMATIC MICROSCOPISTS

To the Editor:—*For a person unable to wear glasses when working with the microscope, do you know of any arrangement for getting around this difficulty, such as having lenses made from the oculist's prescription fitted over the eye pieces?*

M.D., Michigan.

Answer.—Ordinarily a person working with a single eye piece microscope can compensate enough for the absence of glasses by adjusting the microscope. When substantial astigmatism is present, or if there is a sharp difference in visual acuity based on refractive errors, and a binocular microscope is used, correction usually can be made by adjusting each focussing eye piece separately. To provide for astigmatism of a high degree, it is possible to have the astigmatic portion only of the person's glasses ground into a small lens, which is mounted in a rubber gasket and slipped over the eye piece and set in a definite axis. The latter correction may be monocular or binocular.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

ASCARIASIS

To the Editor:—*I have several young patients who began passing adult ascarides after oral penicillin therapy for various illnesses. There are no symptoms referable to the infestation, but three of the children still show fertilized ova in repeated stool examinations. I would appreciate suggestions.*

Harold A. Wente, M.D., Rochester, Minn.

Answer.—Hexylresorcinol in hard gelatine capsules (crystoids® anthelmintic) is the drug of choice. This drug is less toxic and more efficient than the others. The capsules must be swallowed without chewing, for the chemical is irritating to the buccal mucosa. Even young children can be taught to swallow pills by practicing first with placebos. The drug is taken in the morning on an empty stomach. No preliminary purge is needed. Food is withheld for five hours. Two hours after administration of the drug a saline purge is given to rid the patient of dead and dying worms. The dose recommended for adults is 1 Gm.; the dose for preschool children is 0.6 Gm., and for children from 6 to 10 years of age the dose is 0.8 Gm.

Hexylresorcinol yields about a 90% cure. It does not kill the larvae outside the intestinal tract, so that treatment may have to be repeated in one week. Reinfection, of course, should be avoided. The tablets must not be too old, for in such cases the hexylresorcinol tablets may not dissolve high enough in the bowel to be effective.

Milk of higueron from Central America is an efficient drug in elimination of ascarides. Its action is that of a proteolytic enzyme which is extracted from the fresh sap of Ficus glabrata and doliario.

BALATA AS AN ALLERGEN

To the Editor:—*Have you had any reports of epidermal or respiratory symptoms in persons who have been working with webbing impregnated with balata?*

Clifford H. Kalb, M.D., Milwaukee, Wis.

Answer.—On a precise basis balata is the sap or dried gum of Mimusops globosa, a tropical or subtropical tree. Less precisely, the term is applied to a variety of vegetable gums, including at times chicle or zapota. Millions of golf balls have had casings of balata without known harm to golfers. In this and similar manufacturing operations, the balata requires solution such as in benzene, carbon disulfide and kerosene. Clearly, exposures to these several solvents could lead to dermatitis or systemic damage. Balata is credited, by Schwartz and Tulipan, with a capacity to provoke dermatitis. The balata of golf balls and presumably that appearing on impregnated textiles is well polymerized and freed of solvent after full drying, but balata as introduced into machinery belting dressings may exist in a more liquid state. The nature of the "webbing" mentioned in the query is not stated. If this represents jute, it may be recognized that this vegetable matter may induce both dermatitis and bronchitis from its dust. It is suspected that balata, if incompletely polymerized, may constitute an allergen just as the highly useful gum acacia is a known allergen. Judiciously applied patch tests might establish sensitivity to balata or to the unimpregnated fabric.

BLOOD AND SPINAL FLUID SEROLOGIC TESTS

To the Editor:—*When the blood Wassermann test for syphilis is positive, is the spinal Wassermann test always positive and vice versa, in the same case? In case they do not always agree, in what ratio are they always the same?*

W. C. Hensyl, M.D., Berwick, Pa.

Answer.—Patients with positive serologic reactions for syphilis do not necessarily have positive spinal fluid Wassermann reactions, unless there is a syphilitic involvement of the central nervous system. Furthermore, most patients with syphilis of the central nervous system will present positive serologic reactions in the serum. Only on rare occasions will a patient have neurosyphilis with positive serologic reactions of the spinal fluid and negative serologic reactions of the blood.

SIMMONDS' DISEASE

To the Editor:—*A 24 year old, single woman office employee has nausea, vomiting, weakness, loss of appetite, insomnia, pain in the right lower abdominal quadrant and gradual loss of weight from 120 to 82 pounds (54 to 37 Kg.) in the past year. Her hair is graying, and her scalp and skin are dry. Past history includes appendectomy in 1946, exploratory operation for cystic ovary again in 1946 (ovaries are intact) and exploratory operation for adhesions in 1948. She has had no serious illnesses. Menarche occurred at age of 13. The menses were regular, every 28 days, until the appendectomy in 1946, after which periods occurred every three to six or seven weeks. Last menstrual period was December 1949. Her height is 62 inches (157 cm.) blood pressure 82/56 and basal metabolic rate — 28 per cent. Barium examination of the colon disclosed no abnormalities. The kidneys are normal in size, shape and position. Roentgen examination of the skull revealed a normal sella turcica, no evidence of erosion or bone distruction about the sella; bones of the vault are normal, and there is no evidence of chronic pressure. Results of pelvic and rectal examinations were completely negative. Red blood cells numbered 3,800,000, and hemoglobin was 76 per cent. Is this sufficient for a diagnosis of Simmonds' disease? Please outline treatment.*

Stephen R. Minor, M.D., Worcester, Mass.

Answer.—The data presented are not sufficient to permit a diagnosis of Simmonds' disease. One would expect atrophy of the breasts, absent pubic and axillary hair and atrophy of the vaginal mucosa. In addition to the basal metabolic study, laboratory studies measuring the function of at least two other glands are necessary: (1) function of the pituitary to be determined by the excretion of the follicle-stimulating hormone in the urine, the insulin tolerance test and the response of the eosinophils to epinephrine and (2) function of the adrenal cortex to be determined by the excretion of the 17-ketosteroids and of the 11-oxycorticosteroids in the urine, the level of sodium, potassium and chloride in the blood and the Cutler-Power-Wilder test. Studies of the ovarian function may also yield valuable information, namely, vaginal smear, endometrial biopsy and excretion of pregnandiol in the urine.

The treatment of Simmonds' disease resolves itself into the treatment of thyroid hypofunction, plus the associated hypogonadism and hypoadrenocorticism. Thyroid by mouth, starting with 30 mg. and increasing slowly to 60 mg. should be administered. Extra salt by mouth, as well as 4 to 6 Gm. of salt in tablet form, should be kept up indefinitely. Small doses of testosterone 10 to 25 mg., given intramuscularly twice a week, help protect against adrenocortical failure in either sex. In females moderate doses of estrogens may replace testosterone. In young patients chorionic gonadotropin, in doses of 500 to 1,000 units intramuscularly twice a week will stimulate the gonads satisfactorily. Cortisone or pituitary adrenocorticotropic hormone (ACTH) may be used to improve the adrencortical insufficiency in this disease. Small doses (25 to 50 mg. daily) may be given over a prolonged period of time.

PTYALISM DURING PREGNANCY

To the Editor:—*What is the treatment of ptyalism associated with pregnancy? A 32 year old woman, gravida II, experienced ptyalism during her first pregnancy. She is now in her second month and, due to excessive salivation, is having discomfort. Tincture of belladonna and pyribenzamine® have been employed with no marked relief. For a short time the latter appeared to be of some aid, but, because of the side effects and the pregnancy, it was discontinued. Are there any nontoxic drugs that are effective in controlling the ptyalism?*

Herman Rice, M.D., El Paso, Texas.

Answer.—Ptyalism, a rare complication of pregnancy, is related to hyperemesis and may occur alone but is generally associated with nausea and vomiting. It usually begins in the second month, ceases about the fifth month or at quickening, presents the same variations as vomiting and almost always ceases with parturition, but it has been known to continue for a few weeks thereafter. It usually occurs only once but may appear in successive pregnancies and may be absent in one and recur in another. The flow varies in amount; excessive quantities have been reported—more than 1,920 cc. (2 quarts) a day. It usually lessens during the night but may continue unabated. The saliva is watery, tasteless, odorless, limpid and not acid; it has little ptyalin. The patient cannot swallow the saliva, and it nauseates her.

Ptyalism occurs more often in psychotic women. The diagnosis is not difficult, since mercurial salivation is attended by fetor and stomatitis. The treatment is similar to that of hyperemesis. The drain of this large amount of fluid, the absence of digestive powers and the loss of appetite can produce a condition of exhaustion, which resembles that produced by intractable vomiting and on rare occasions has been an indication for termination of pregnancy.

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To the Editor:—*A 41 year old white woman has had cystitis following intercourse many times during her married life of 10 years. Her general health previously and now has been excellent. The cystitis always follows intercourse by one to three days and never occurs other than at that time. Such attacks are easily terminated by the use of such agents as sulfonamides, aureomycin and mandelamine. Between attacks there are no abnormal urinary findings or symptoms. In 1941, a few months after marriage and following the second attack of cystitis, cystoscopic findings and retrograde pyelograms were normal. This patient has had two normal pregnancies with no complications. The genital tract is still normal. No urinary cultures have been made; however, a Gram stain of the urine sediment always shows a gram-negative, motile bacillus. The urine is always acid. What is the probable cause of so many recurrences, and what can be done to prevent them?*

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Answer.—The first step in the solution of this patient's problem is a very careful examination of her genital tract. The inquiry states that results of the gynecological examination were negative, but it does not state how recent this was. The second step is cystoscopic examination, x-rays and intravenous pyelograms. The inquiry states that when these were made some years ago they were normal. The third point is the condition of her intestinal tract. Many patients with recurring attacks of so-called cystitis suffer from diseases of the gastrointestinal tract, such as cathartic colitis, spastic colitis, constipation, hemorrhoids and amebiasis. Therefore, this possibility must be ruled out. Last, but not least, is the significant statement that these attacks of cystitis follow intercourse. This is significant in view of other statements that everything else has been normal. If results of the genitourinary examination, the gynecological examination and the examination of the intestinal tract are all negative, there probably is a psychic element in this case, and she should consult a psychiatrist. It would be interesting to know whether sexual intercourse was painful. This clinical picture is not so uncommon.

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A. E. A. Wanderer, M.D., Oak Park, Ill.

Answer.—It is hardly likely that the amount of cathode rays associated with television machines can penetrate deeply enough into the body to produce sterility. Therefore, some other cause for the low sperm count should be looked for. Generally, the attempts to increase a man's sperm count are not very successful. Nevertheless, every effort should be made to try to increase the procreative ability of the man. The diet should be discussed with the patient, because occasionally an improper diet may be responsible for impaired fertility. Vitamins, such as A and E, have been prescribed, but an impartial analysis reveals that these have not helped much to stimulate spermatogenesis. Other vitamins have not been tried out sufficiently.

In the discussion with this patient, the matters of excessive amount of work, fatigue, marital troubles and other anxieties should be discussed. Every effort should be made to overcome tiredness, overwork, excessive use of alcohol and sedentary habits. If the patient is overweight, an effort should be made to reduce the excess.

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and
Julius Sobin, M.D., Newark, N. J.

Improved methods of cancer detection and public education on the subject mean that physicians are seeing and treating many more malignant lesions than ever before. More widespread lay knowledge about cancer has almost resulted in a situation in which "every man is his own diagnostician." Formerly, cancer was almost unmentionable between patient and physician, and most persons did not wish to know nor expect to be told of such diagnoses. The pendulum has swung far in the opposite direction, and, along with its benefits, the educational campaign has resulted in an almost national cancerphobia. Our civilization breeds guilt feelings of one form or another in almost all of us; since guilt tends to seek out a "punishment" the cancer-education campaign has provided potential punishment for many persons.

In any case, the attitudes of cancer patients have altered significantly in the past 10 years, and not the least of the problems is the psychological management of these cases. In medical school lectures, it is generally customary in an outline of the treatment for virtually any chronic illness to list psychotherapy as the final item under treatment. Usually the elaboration of this point consists only of a suggestion to "help the patient adjust to his condition." The how's, why's and wherefore's are seldom discussed. Although each physician handles not only his cases in general differently but each patient somewhat differently from any other, it is felt that a general review of the problem may be helpful and suggestive.

TO TELL OR NOT TO TELL?

Unlike tuberculosis, where danger of contagion makes informing the patient of the nature of his illness practically mandatory, in cancer there is a distinct and sometimes painful choice to be made. Certain considerations are involved in making this decision.

1. The physician should be absolutely certain of the diagnosis. Until he is certain, any action that might arouse suspicion by the patient of the nature of his illness should be avoided. It is best even to dissimulate at this stage. There must be some appreciation, however, of the severity of the patient's symptoms. Unless it is impressed on the patient that the condition may be serious, difficulty may arise in having him follow through with the necessary diagnostic procedures. If he questions the necessity for these additional tests, a suggested approach would be "I want to make certain this is only lymphadenopathy" (or hemorrhoids or another condition). If subsequently the diagnostic procedures give normal results, the patient has been spared from severe psychic trauma, and, if the evidence shows abnormal conditions, few patients will not understand that the physician was attempting to spare them anxiety until he himself was certain.

Mention of disease should always be coupled with stress on the need for treatment: "The symptoms will become annoying or dangerous unless you follow through with treatment." When some patients learn that their illness is likely to be fatal they feel that treatment is useless. It must be emphatically pointed out to these patients that no illness is absolutely fatal, and that, with proper treatment, there is at least some chance that they will recover. That they owe the obligation to undergo treatment not only to themselves but to their families is worth stressing, if this reaction occurs.

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hood of her child's becoming infected with some current contagious disease and when a realistic answer is given is horrified by even a small positive possibility.

If the Patient Is Told.—Regardless of how stable a person may seem, the psychological shock is certain to be severe. This can be "buffered" to some extent if the truth is told in easy stages. It is often desirable, for instance, when the patient inquires about the possibility, to discuss it purely hypothetically, even though the physician already knows that there no longer remains any doubt. Stress should be laid on the fact that therapy is available for even the most malignant of neoplasms. In some patients, statistics as to life expectancy and such facts as those presented by Finesinger,[1] showing that life expectancy for the general population would be increased less than two years if cancer were completely eliminated, may prove of value but is not a great consolation to most patients. The physician should be as honest as possible with the patient about his condition and try to get him to accept the illness as a fact rather than either a major disaster or an unimportant incident.

When the physician does reach the stage at which he is ready to tell the patient definitely of the nature of his illness, he should have available and visible concrete evidence, such as the pathological report, if possible, and x-ray report. It is probably advisable to interpret the results to him rather than to merely present him the pathological report. For a patient to read that there is a widespread malignant carcinoma is an unnecessary cruelty, since the same idea can be given with less of a shock by the interpretation of the physician. It is important to forestall the possibility of raising false hopes or of driving the patient to charlatans and quacks, who might question the diagnosis, if it has not been conclusively enough presented.

No matter how great the confidence that a patient has in his physician, he will probably take into consideration the possibility of his being in error. If at all feasible, at least the possibility of consultation with a colleague or a reputable specialist should be offered to the patient.

The patient should be advised that it would be desirable to get his affairs in order; but a definite date as to the likelihood of his death is extremely undesirable. Many a physician has hurt his reputation by saying that a patient has at most six months to live when, a year later, this same patient was contradicting this estimate. The advice should be given not as a death warrant but as a possibility for which it will do no harm to prepare. The question of the patient's plans for the disposition of his property and of his life insurance should also be raised although efforts should be made to avoid making this a focus of his attention.

Immediate reassurance should be given to the patient as to the nature of the therapeutic program, so that he will feel that everything is not hopeless and that everything possible is being done for him. Most patients associate cancer with excruciating and chronic pain, and it is certainly desirable to reassure the patient insofar as possible as to the extent of discomfort involved and the amount of relief that may be expected from analgesics if they are found necessary. When analgesics are used, there should be no hesitancy in their liberal application. The aim should be to prevent discomfort rather than to alleviate it. A combination of *d*-amphetamine sulfate (dexedrine®) and *dl*-amphetamine sulfate (benzedrine®) will often alleviate anxiety and depression.

For reasons beyond the scope of this article, it has been found that many patients with cancer develop a strong sense of guilt (cf. Nolan D. C. Lewis' aphorism, "Cancer is paranoia at the cellular level"), and, as much as possible, this should be alleviated. Many of these patients feel that the financial strain placed on their family is one of the most unbearable elements of the illness. A discussion concerning the extent of financial involvement and the means by which it can be minimized should be introduced, whether or not the patient raises the question. The physician should stress that he will keep his own part of the expense as low as possible.

Whether the family should be informed of the patient's illness and if so, how, should also be reviewed in detail with the patient. The major responsibility rests with the physician, however. It is unlikely that the patient has ever had cancer before, whereas the physician has had much contact with problems of this kind. It is the physician's responsibility to advise and counsel the patient and actively suggest the course he should follow. At a time of stress, it is a consolation to the patient to have present someone, such as a physician, who appears adequate to advise competently what should be done.

Unless there are strong indications to the contrary, the patient should be urged to retain his usual job as long as possible. A complete shift of activity before it is absolutely necessary appears to be extremely demoralizing. Even when the patient becomes partially incapacitated, he should be urged to carry on parts of his job that do not too severely tax him, even if only on a part-time basis. Auxiliary activities should be introduced at first as purely diversional, so they are not made to appear as childish and inconsequential substitutes for usual activities. If the patient will not be able to carry on his usual activities, he should be helped to plan as far as possible for substitute ones. If these can be developed and a real interest aroused in the patient before he is completely incapacitated for his regular work, a major therapeutic step will have been achieved. The nature of the substitute activities is naturally largely dependent on the character of the patient himself. Such activities as painting, radio contests, crossword puzzles, and stamp collecting are within the physical capabilities of all but the most incapacitated. The physician should be a pillar of stability, able to advise the patient at each step of the way.

If the Patient Is Not Told.—If it is found desirable to conceal from the patient the nature of his illness, it is usually wise to substitute some other condition. As the symptoms progress, the patient will inevitably know that something is wrong with him, and, if he is able to attribute it to some relatively benign condition, he will at least have the consolation of "understanding" the cause of his complaints. It is well to forewarn him that such discomforts are likely to occur. The nature of the condition substituted is dependent, of course, on the location and extent of the neoplasm and should not actually exclude the diagnosis of neoplasm. "A type of stomach ulcer," "a kidney blockage," "a liver dysfunction," is the type of equivocal diagnosis suggested. Here again emphasis should be laid on the fact that the condition may become serious unless properly treated. Unless the patient is sufficiently impressed with the fact that he must have treatment to avoid serious discomfort, he may tend to disregard treatment to a large extent, even when it might prove of distinct benefit to him.

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[1] Finesinger, J., in Blain, D.: Elements in Motivation for Cancer Examination and Treatment, read at the annual session of the American Radium Society, Atlantic City, N. J., June 30, 1949, unpublished.

At times the cancer is not discovered until laparotomy is performed. In these cases, a diagnosis of "a certain type of ulcer" or "one type of bowel block" can be offered, and removal of the offending organ deferred on the basis of there being "a slight infection," which must be treated first. This will even provide a reason for rehospitalization of the patient if he becomes so debilitated that it is necessary. The physician should exercise great care not to reveal the truth inadvertently, and it may even be desirable to carry a euphemism on the patient's chart or office record. Office personnel should also be trained to be noncommittal and discreet (outside as well as inside of the office) and, in general, to be optimistic and helpful.

Occasionally, a patient who you feel would be better off not knowing will ask directly whether he or she has cancer. Except in rare instances, it is hazardous to answer with an outright denial. Eventually, the majority of patients who really want to know will discover the truth, and if you have deliberately lied to them, they will lose confidence in the real reassurances and consolations that you could offer. It is better to avoid answering at all than to present the patient with a direct falsification. The major problem in the handling of those patients who are not told their diagnosis is the management of the family, which is discussed later.

Management of Family If They Are Told.—If the patient has been informed of the nature of his illness, he himself should be the major judge as to who should and who should not be told. The way in which the family is presented with the facts should also be decided on by the patient himself. It is again the responsibility of the physician to suggest to the patient ways and means of presenting the facts. The patient should be strongly urged to bring into confidence at least one responsible member of the family, although this need not be the nearest relative. It will probably be necessary to impress the family at least to some extent with the seriousness of the patient's condition, so that they will be cooperative. Although the seriousness of the illness should not be minimized and the unsuitability of such an occurrence not overlooked, still the advantages of knowing the truth can be contrasted with the consternation of unexpected death.

Most of the "don'ts" connected with the behavior of the family are rather obvious. Frequent and tearful commiserations are certainly undesirable, but false cheerfulness is probably even more disturbing. When all concerned realize the seriousness of the situation, obviously unmeant gaiety strikes an extremely jarring note. The most desirable attitude on the part of both the family and the patient is acceptance of the fact as such, with an effort to expend the remaining time as constructively as possible. Finances should be discussed with the family, and, even though prognosis is poor, the moral obligation of the family to follow through with whatever treatment is available should be emphasized.

The family should also be cautioned to avoid discussions with the patient involving plans contemplated at a time when the patient will no longer be present to participate even vicariously. This does not mean that concurrent activities should not be entered into. The patient already feels left out of things, and, unless he protests, he should be allowed to participate, at least at second hand, in what is going on.

Also to be strictly avoided are regrets, recriminations, and "might-have-been's." If the patient falls into this type of mood, an effort should be made to turn the discussion toward more neutral subjects rather than end it abruptly with "let's not talk about that." The family should encourage the patient to continue at his regular job as long as possible but should begin to interest him in substitute activities. He should be encouraged in his hobbies and in occupational therapy. Again, too much enthusiasm may be detrimental. Praise is in order for those things that the patient does accomplish, but it should not be too much beyond the real merits of the work. If the patient is partially incapacitated, he should be made to feel as useful as possible. He should be encouraged to do as many useful things as he can, e. g., he might make minor repairs or telephone food orders.

As much time as possible should be spent with the patient. This does not mean that a constant conversation need be maintained. Simply sitting in the room reading or listening to the radio provides the human contacts that most persons need during a crisis of this kind. Whether the patient should have many or few visitors should depend in large part on his former mode of existence. This should be kept as nearly normal as possible. As a rule, close friends should be encouraged to visit, but emotional, unstable persons, whether relatives or friends, should be excluded as far as possible.

In some cases, when the family has knowledge and the patient has not, the patient himself exerts much pressure to find out "what the doctor said." At times, strong guilt feelings may be created in the family if they have to tell deliberate lies, and sometimes the situation can be helped if the statement to the family is worded in an equivocal manner; however, it should still be clear. "I will not say what disease the patient does have, so you can honestly tell him that I have not said he has cancer, if he asks." "I have told the patient that he has such and such a condition, since his symptoms in part resemble this disease. I am not telling you that he has cancer, so you can be perfectly honest in denying that I said he has cancer, if he does insist on knowing what I say." It is surprising how helpful such a wording of the diagnosis can be to relatives.

Since cancerphobia is already widespread, the occurrence of cancer in a member of the immediate family may activate a large amount of anxiety, and it is wise to offer the possibility of a complete physical examination to other members of the family, to allay their fears.

If the Family Is Not to Be Told.—Unless it is specifically requested, it is probably preferable not to volunteer any information as to the patient's condition. In some cases the family has no desire to know the progress and it is not unlikely that they may never specifically inquire. In reply to insistent questions concerning the nature of the patient's illness, when they can no longer be deferred, the matter should be discussed with the patient, if he himself knows, and consideration given to whether it is wise to inform the family. Here again, the physician should act as adviser to the patient. It may be easier for him to tell the family than for the patient to do so, which may also allow the patient and his family to avoid discussing the illness, which may lessen the tension. In telling the family, as in dealing with this matter with the patient, the physician might use some euphemistic substitute.

When the physician is questioned as to the patient's progress, he may give such answers as "He is getting along as expected" or "He is doing well, all things considered," which are usually satisfying and do not put the physician in the position of stating outright untruths.

If no one in the family is found to be responsible enough, either emotionally or otherwise, to be told the plain facts of the case, a medicolegal problem exists. It is wise in these circumstances for the physician to protect himself by having a colleague called in as consultant who can concur in the decision of the physician and the patient to withhold knowledge from the family. If a question later arises, there will be adequate evidence that this was the patient's decision.

GENERAL CONSIDERATIONS

If the patient is considered inoperable, the relative value of hospitalization in relation to benefits to be obtained should be discussed with the patient, if he is told, or the responsible member of the family if the patient is not told. The physician should suggest what seems to him the most feasible plan. In many of these cases, home care is psychologically more beneficial and provides the patient with more pleasant and active surroundings than would be the case if he were hospitalized. In other cases, it may help both the family and the patient if he does not have to remain at home and be constantly reminded of his "tragedy." The strain on the family, both physically and emotionally, should be carefully weighed. The reassurance that something is being done when the patient is hospitalized must be weighed against the fright that may be aroused by prolonged hospitalization.

TYPES OF REACTION TO KNOWLEDGE OF CANCER

It is most desirable, of course, that the patient accept the fact of his disease and that he plan the remainder of his life accordingly; however, at times, when the diagnosis is beyond question and can be substantiated by laboratory and x-ray reports, the patient refuses to believe the inevitable facts. He may then resort to visiting a great number of other physicians. This provides a hope of escape and, as previously mentioned, the physician should anticipate this by suggesting other consultants if the patient has any desire for independent opinion. It is probably even advisable for the patient to be seen by a consultant before the physician gives his own final decision. At times, even two or three other opinions do not satisfy the patient, and he persists in a futile search for someone who will deny the existence of his condition. Anxiety and severe depression usually arise when someone is in an unpleasant position and there are no active steps he can take to relieve the tension. Visiting large numbers of physicians may at least provide activity that, although fruitless, may alleviate the pressure.

The greatest danger in cases of patients who refuse to accept the diagnosis, when it has been felt desirable to tell them, is that, instead of seeking reputable medical assistance, they become victims of various charlatans. If the patient cannot be convinced of the validity of the diagnosis, it is important to maintain a good enough relationship with him to prevent his falling into the hands of unscrupulous persons who would exploit him. The physician should not react to a refusal to accept an obvious diagnosis by feeling that a direct assault has been made on his medical integrity. Some persons find visiting physicians a useful escape device; although the physician should not encourage it, it may be considered psychotherapeutic. However, the patient should be prevented from falling into the hands of quacks.

Occasionally, even though the patient has been unequivocally told what his diagnosis is or has been presented the facts in such a way that the conclusion is obvious, he fails to grasp the truth. Some physicians may feel guilty that they have not made the matter sufficiently clear. This kind of rejection of the diagnosis by the patient is essential for his psychological health. If the patient does not want to know the diagnosis, the matter should not be forced.

Flight from the Disease.—At times patients will become actively psychotic and lose touch completely with reality. The management of patients of this type is naturally for the psychiatrist. A prompt referral without unnecessary temporizing should be made. Other patients will develop compensatory outlets, the most frequent of which is turning to "religion." As long as the patient can develop and exercise his new-found "truth" without interfering with his medical treatment or injuring himself and his family in other ways, he should be encouraged in this activity. It would be surprising if the prospect of decreased life expectancy did not result in some such reorientation. The intensity of previous religious beliefs may be increased, or there may be a devoted adherence or belief in the importance of almost any "cause" or theory. At times the new belief is radically different from the patient's former views. If the new "religion" is likely to cause a severe financial or emotional drain on the family, the problem is complicated. While the main theme of the belief should not be destroyed, it is often possible to turn the patient's expression of it into less devasting channels. Instead of allowing him to give a major part of his estate, which may be needed by his wife and child, to "The Society for Motherless Cats," the physician should try to get him to substitute such activities as bringing the matter to the attention of the public in the newspapers or writing to persons with similar beliefs.

Another form of flight from the disease is suicide. In most cases, this is more verbal than actual. There does exist a real possibility, however, in almost every case, and it is the physician's responsibility to guard against this, insofar as possible. The stigmas of incipient self-destruction cannot be detailed in full within the scope of this paper, but it is important to note a sudden, complete acceptance of the situation following prior difficulty in adjustment, history of depression earlier in the patient's life, and insomnia, depressed posture, and anorexia, occurring without adequate organic basis. It is advisable to see the patient daily until it is certain that his emotional state is such that there is no great suicidal risk.

Occasionally, a patient will respond with euphoria to the knowledge of a fatal disease. As a rule, this condition wears off and should always be regarded as a compensatory type of reaction covering a severe depression. The euphoric patient is often a greater suicidal risk than one who is openly depressed. This type of reaction is basically emotional in origin, and it is not advisable to argue with the patient to convince him of the seriousness of his condition. In some cases, a mild *belle indifference* continues and may well constitute a satisfactory reaction to the situation. By accepting the real fact intellectually but not emotionally, the patient may be able to protect himself against catastrophic inner turmoil.

Overreaction to the Disease.—At times knowledge of a chronic fatal illness may result in complete physical collapse, and hospitalization becomes necessary, not so much for the treatment of the chronic illness as for building the patient up to some sort of functional level. Patients of this type should be treated with much affection and consideration by both physician and family. If they return to a pseudoinfantile state, they should be handled in many respects as children.

Severe and prolonged depression with or without suicidal tendencies may result when the facts of the condition are made known. A certain amount of depression can well be considered normal, but if this persists, it should be treated. Electric shock therapy, regardless of its ultimate merits in the treatment of the more serious mental illnesses, is almost specific for reactive depressions of this particular type. There are few medical conditions, except metastases to lung or bone (where there is resultant danger of hemorrhage or fracture), that preclude the use of this type of treatment, which, if necessary, can even be given in the home. Usually, six treatments will relieve the extreme elements in the depression.

Obsessive Preoccupation with the Disease.—That a patient with this condition will dwell on it to some extent is to be expected. As previously outlined, efforts should be made to divert him from this type of preoccupation. In cases in which this is unsuccessful and the patient's preoccupation becomes so severe that he makes life intolerable for both himself and his family, serious consideration should be given to one of the psychosurgical procedures. In addition to relieving intractable pain, prefrontal lobotomy usually results in the loss of this preoccupation with self and future, which leads some chronically ill patients to suffer out of all proportion to their illness.

Other techniques, such as hypnosis and intensive psychotherapy, are valuable in some cases.

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MANAGEMENT OF RESIDUALS OF INJURIES TO SPINAL CORD AND CAUDA EQUINA

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About 300 veterans suffering from injuries to the spinal cord and cauda equina are in constant residence in the medical wards of the United States Veterans Administration Hospital at Hines, Ill., under the care of the Medical Neurological Service. In addition, the Neurosurgical Service is responsible for patients with current acute injuries and those with old injuries who need surgical treatment, such as rhizotomy, exploration, or chordotomy. Patients requiring these procedures are transferred to the latter service, which has available an additional 75 beds.

ORGANIZATION

Staffs are appointed and treatment is operated under the Deans' Committee plan. In this plan, the attending and consulting staffs are appointed from the faculties of the medical schools in the Chicago area. It so happens that the staffs in neurosurgery and medical neurology are members of the faculty of Northwestern University Medical School. Under this plan, in addition to the regular staff of the United States Veterans Administration, residents in training also act in a capacity analogous to that of ward surgeons.

In planning the organization of the treatment of patients with wounds of the spinal cord or cauda equina, it was decided that injuries, as well as diseases, of the nervous system were properly the responsibility of medical neurologists.

Consultants in neurosurgery, general surgery, orthopedic surgery, plastic surgery, genitourinary surgery, medicine, and physical medicine are appointed to this service. Each is responsible for his particular specialty. Not only do these specialists serve when called into consultation in a particular case, but it is their responsibility to study the relation of their specialty to the problem of the treatment of these patients and to devise the best means of prevention of the complications within their specialty and their most efficient treatment, and then, on consultation with the Department of Medical Neurology, to put these methods into effect.

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This plan has operated admirably since 1946. Many studies have been made upon special aspects of the problem. Among them have been studies on spasms, spasticity, and reflex activities; pain; dysregulation of temperature; reflex hypertension; orthostatic hypotension; sweating; dysregulation of water metabolism; bladder and rectal function; nutrition and bodily function; orthopedic, surgical, neurosurgical, and genitourinary surgical problems; problems of physical medicine, and the follow-up observation of discharged patients by social service. In addition, analyses are made of the pathologic changes found in case of death of any of the patients.

From these studies and the observations and experience of all the consultants and physicians, certain conclusions have been reached about broad principles of management. It is not intended in this article to describe medical or surgical procedures, to compare one method with another, or to hold a brief for any favored devices. Such descriptions have been made before upon numerous occasions.

It is our intention, rather, to relate the conclusions reached by us in respect to basic principles, as may have been indicated by our experience. Our conclusions are derived from our experience gained from the treatment of the whole material, 767 patients, as well as from more intensive studies on smaller groups or patients selected for investigation of some particular subject, such as pain or spasms.

In a comparison of the evolution of signs and symptoms and of complications of injuries of the spinal cord and cauda equina sustained in civilian practice before the war with corresponding data on patients injured during the war and later treated under the oft unavoidable adverse conditions of military practice, many differences could be found in relation to mortality, morbidity, and complications.

Munro [1] took advantage of his many years of study and attention to injuries of the spinal cord when he compared his extensive experience in civilian experience with his later observations on the residuals of injuries to the spinal cord and cauda equina resulting from war wounds after treatment in military practice and final residence in the United States Veterans Administration hospitals.

To those of us who had not had extensive experience with injuries of the spinal cord and cauda equina in civilian practice, such a point of comparison was unavailable. However, since the end of the war many veterans have sustained injuries to the spinal cord and cauda equina and either have been treated immediately in civilian hospitals and transferred soon thereafter to the United States Veterans Administration hospitals or have been taken immediately after injury to such a hospital. By a comparison of the evolution of signs and symptoms in this group with that of similar signs in men injured overseas during the war and first treated in military hospitals, a similar study was made possible. The results of this study led to parts or the whole of some of our conclusions. In addition, certain special studies led to conclusions as to the site of origin of distal burning pain; the evolution of pain; the evolution of spasms, spasticity, and reflex activity; the evolution of decubitus ulcers, of genitourinary and bowel function, and of recovery after injury; changes in the physical bodily state; evolution of genitourinary complications and the result of their treatment by a program of physical medicine; follow-up observations after discharge of the patient, and pathologic changes found after death.

PAIN

From our discussion of pain we shall exclude that type which is referred distally from lesions of roots at the level of injury, since the treatment of these lesions, as in the case of tabes and other diseases producing root pain, is well known. We shall discuss only that pain which occurs below the level of the lesion, which is diffuse, often imperfectly localized, and is described by such words as burning, tingling, stinging, aching, pins and needles sensation, or sharp and shooting. In other words, it partakes of the character of a paresthesia much more than that of a simple pain. In 80% of the patients with this type of pain the word "burning" is considered most fitting to describe it. The localization of this pain is often inconstant in a given patient, and the pain usually is felt diffusely in such areas as the soles, both lower extremities, the abdominal wall, or the lower half of the abdominal wall only. Relatively soon after the injury the pain is sufficiently intense that the patient spontaneously complains bitterly and asks for relief. To relieve this, drugs, including narcotics, have been used freely, often ineffectually, and frequently to the point of producing addiction. Because of this, surgical procedures have been performed with the purpose of interrupting neural pathways that transmit painful stimuli to the brain. The two most commonly performed procedures have been section of the posterior roots and of the spinothalamic tract within the spinal cord, and chordotomy. First, we wish to report upon our conception of the site of origin of this pain, to the end that certain surgical procedures will be made immediately to appear potentially ineffectual in any way.

To explain such pain, many theories have been advanced. Practically all call upon the intermediation of the sympathetic nervous system.

It has been observed by us in a number of cases that when, in the presence of an injury of the spinal cord, a limb may have been amputated at the thigh, the patient not only seems to feel the existence of the amputated lower extremity and describes its position, but also suffers from the same burning pain that he experienced before, and that is present in the remaining limb. This indicates immediately that there can be no centripetal impulses from the amputated limb which can give rise to such sensations.

In cases in which the spinal cord has been injured and a spinal-fluid block is present, we have found that with spinal anesthesia below the level of the lesion, interrupting centripetal fibers through the posterior roots into the spinal cord, this diffuse burning pain is unaffected. On the other hand, when, in the presence of the spinal-fluid block, the distal end of the proximal segment of the injured spinal cord is anesthetized by spinal anesthesia, the pain disappears. To us this indicates that the site of origin of the pain is the distal portion of the proximal segment of the injured spinal cord. Therefore, posterior-root section and any operation upon the sympathetic nervous system would be futile.

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[1] Munro, D.: Rehabilitation of Veterans Paralyzed as the Result of Injury to the Spinal Cord and Cauda Equina, Am. J. Surg. 75: 3, 1948.

There remains to be considered the advisability of chordotomy. Chordotomy performed by trained and qualified neurosurgeons is associated with no serious danger of complications; but chordotomy performed by inexperienced surgeons, often untrained in neurosurgery, is a dangerous procedure indeed. If it were assumed that a patient having complete paralysis of motion and loss of sensation below the level of the lesion was doomed to remain in that state during the rest of his life, it would make little difference whether the level of his lesion were to be raised to one a little higher in the thoracic portion of the cord. However, as will be shown, some recovery of motion and sensation, or of one alone, may occur when for many months a complete interruption of the spinal cord has been assumed to be present.

Even if the recovery does not result in useful motor function, it is associated with beneficial effects, such as the healing of decubitus ulcers, lessened incidence of later-developing decubitus ulcers, and improvement of bladder, bowel, and genital function.

For these reasons, the indications for chordotomy must be assessed very carefully. In our series, 16 patients have been subjected to chordotomy from one to three times each, with a total of 23 operations for the group. In only two patients was chordotomy followed by complete and permanent cessation of all types of pain. For both, two operations were required to achieve this result. In five patients six chordotomies produced no effect whatsoever on the preexisting pain. In the remaining nine patients, the procedure produced temporary relief, or relief from only one type of pain present (usually root pain) and not from other pain, or the operation was actually followed by an onslaught of pain that had not existed previously.

What is the life history of this pain? In 1947, in a high incidence of cases, in fact, in 82%, this pain was noted as a spontaneous complaint. At that time, in many instances it seemed severe enough to warrant active therapy. As time passed, this type of pain receded from consciousness, and its presence was elicited only on direct questioning. Thus, of 217 patients, it was spontaneously complained of by 20%. In some cases it had diminished in severity as well, so that even when attention was directed to it the description of the pain indicated its lessened quality. At present, it is rare to find a patient with severe distal pain of this character, and there exists only a well-repressed awareness of easily borne distress.

Many times we have been gratified to find that the postponement of surgical measures to relieve pain was justified by the development of this high threshold for the pain. It is our conclusion that for distal "burning pain" posterior-root section and sympathectomy are contraindicated, since the site of origin of the pain is in the distal end of the proximal segment of the injured spinal cord. Because such pain in time both diminishes in severity and recedes in consciousness, chordotomy should be postponed as long as possible, and resorted to only in exceptional cases. It should be permitted to be performed only by experienced and qualified neurosurgeons.

SPASMS

The word is usually used loosely to denote involuntary movements of the extremities. Included in this definition are the pseudospontaneous spasms and the reflex movements which follow known stimulation, usually of the extremities. In the former case the motor movements are usually bilateral and symmetrical; in the latter, they are unilateral and may be followed by contralateral movement. Rarely are they symmetrical and bilateral. The patient is unable to distinguish between them, and the information obtained from patients who have not been observed from the beginning of injury probably includes both. Therefore, estimates of frequency, etc., vary in accordance with the source of information. Fortunately, the life histories of the two types are similar; this is not strange, since pseudospontaneous spasms result from stimuli, but they are usually midline stimuli, and often visceral, such as a full bladder or rectum. The spasms are also evoked by stimuli from sacral decubitus ulcers, handling of the genitals, and movement of catheters.

These spasms constitute a serious disability not only in evoking discomfort, but in interfering with healing of bedsores, genitourinary care and rehabilitation, and, rarely, in leading to dislocations and fractures. No medicament has been found of any real value, despite reports elsewhere to the contrary.

Therefore, section of the obturator nerve, and rhizotomy, usually anterior, less frequently posterior, have been resorted to. If the rhizotomy is successful in either case, the increase reflex activity is abolished. However, once anterior rhizotomy is performed, the patient can never have any useful return of motion.

With rare exceptions, for some time after injury, the patient has complete paralysis of motion and sensation. Later, recovery may occur at variable periods, and useful recovery has been seen when it began as late as five months after injury.

Since we have found that actual recovery, in some instances fairly useful, occurs in 21% of cases, great caution should be exercised in deciding that a rhizotomy should be performed. Not only is there indication for caution because of the possible recovery, but the life history of these spasms also emphasizes it.

First, the incidence of the spasms varies in relation to the segments affected, although succeeding analyses vary with the particular group. They all indicate that 60 to 70% of all patients with spinal-cord injuries have these spasms and that they are present with all cervical lesions of the cord, with 75 to 85% of thoracic lesions, with 31 to 44% of lumbar lesions, with 30% of lesions of the conus and cauda equina, and, of course, not with lesions of the cauda unless complicated by chordotomy.

They begin, increase, reach a peak, which is maintained, and then, in a great number of cases, diminish in severity, if not in frequency. In 71% of all cases they diminished in severity. During the early period of caring for the patients, the severity of the spasms was sometimes so great that a considerable number of the men were tied to the bed, chair, or frame. It is rare now to see a patient with spasm which seriously interferes with treatment or activities, and, of course, none need be restrained. Only 18 rhizotomies have been performed among the 589 patients, most of these being done before the patient's admission to the Hines hospital. Judged by whether there was an increase in rapidity of rehabilitation, or in degree, as measured by the Department of Physical Medicine, the results were not favorable in most cases.

With the Department of Neurosurgery, we early agreed that unless the lesion was proved to be anatomically complete, rhizotomy was to be done only on rare occasions, when it would be a life-saving procedure. We have not regretted that decision.

We believe that by adequate treatment of bladder and bowel dysfunction and by healing of bedsores, we have been able to bring about a diminution in the severity of these reflex movements.

DECUBITUS ULCERS

There is no uniformity of opinion as to the cause of decubitus ulcers, or so-called trophic ulcers. By some they are considered to be solely neurogenic; by others, solely traumatic. The truth probably lies somewhere between these two extremes of thought. That these so-called trophic ulcers are related to a dysfunction of the nervous system is almost self-evident.

The amount of trauma to the limb on the side of a unilateral experimentally produced section of the sciatic nerve, which resulted in numerous ulcerations of the foot, was in our experience no greater than that to which the control limb was subjected. With peripheral nerve lesions in man, although ulcers appeared only when the part was traumatized, they developed only in areas of defective sensation. Despite total paralysis of the lower extremities as the result of anterior poliomyelitis and the accompanying pressure and immobility, ulcers are indeed rare. On the other hand, in syringomyelia and tabes dorsalis they are common.

If the loss of sensation in spinal-cord injuries resulted in less frequent change of position, and this produced more continuous pressure on a part and was the full explanation of pressure sores, these lesions should develop as frequently late after the injury as soon after it. This was not the case. Severe sacral decubitus ulcers were the first to be observed in large numbers; then, after a time, when the patient was able to turn from side to side or was turned on his side, trochanteric ulcers appeared, and when, finally, he sat in a wheel chair or was driven about ischial ulcers appeared. Because of this, the definition of the early occurrence of ulcers differs with respect to the time allotted to this period. We defined early sacral ulcers as those occurring within the first month, early trochanteric ulcers as those occurring in less than two months, and early ischial ulcers as those occurring in less than six months. Of 89 patients studied intensively, sacral decubitus ulcers had developed in one month or less in 59.2%; trochanteric ulcers, in less than two months in 24.7%, and ischial ulcers, in less than six months in 8.6%. On the other hand, sacral decubitus ulcers had developed after one month in 12.1%; trochanteric ulcers, after one month in 23.5%, and ischial ulcers, after one month in 29.7%. It is evident that in our definition of early trochanteric and ischial decubitus ulcers too short a time was allotted. However, the sacral decubitus ulcers illustrate the point that by far the greatest number develop in less than one month. It is well known that deep necrotizing ulcers, destroying tissue to the bone, may occur during the first week after injury. Another indication of a neurogenic factor is seen in the distribution of ulcers at various levels, being 100% with lesions of the cervical portion of the cord, 100% with lesions of the first to the ninth thoracic segments, 84% with lesions of the 10th to the 12th thoracic segments, and 80% with lesions below the first lumbar segment. A further indication is found in the fact that of 83 patients with complete physiologic interruption of the spinal cord, ulcers occurred in 75, or 90.5%, and of 93 patients with incomplete or recovering lesions, ulcers occurred in 71, or 76.5%.

Still another indication is found in the fact, in part referred to, that the longer the time after injury, the smaller the percentage of ulcers. Thus, of 300 cases, the incidence of ulcers which developed before the first year was 90%; the incidence of ulcers which developed one to two years after injury was 65.1%; the incidence of ulcers developing two to three years after injury was 60.4%, and the incidence of ulcers developing three to four years after injury was 40.8%. Not only was the incidence related to time of onset, but the number of ulcers per patient diminished as the time between injury and development of ulcers increased. Thus, in intervals of the same sequence as those noted above, the average number of ulcers for each patient was 2.78, 2.74, 1.74, and 1.6.

Another indication is found in the comparative incidence of ulcers in patients in whom pain and temperature sensibility had partially recovered early after injury. Of 64 such patients, 14, or 22%, had ulcer at some site, whereas the incidence of ulcer in patients with complete interruption of the cord was 90%. In only two patients did decubitus ulcers develop at the Veterans Administration at Hines when recovery of pain and temperature sensibility had partially been accomplished.

In view of all these correlations, we believe that there is an important neurogenic factor in the development of ulcer. This is, of course, not the only factor, as shown by the fact that, although the population of the patients with injuries to the spinal cord is increased by new admissions and depleted by discharge of older patients, the incidence of ulcer and the number of ulcers per patient have steadily decreased since 1946. Thus, in 1946, 75% of patients had ulcers, with an average of 3.4 ulcers per patient; in 1947, 40% of patients had ulcer, with an average of 2.8 ulcers per patient, and in 1948, 25% of patients had ulcer, with an average of 1.9 ulcers per patient. This decrease occurred despite the inclusion of a number of the old ulcers in the material, for which surgical results were not as successful. Another indication of the possible prevention and spontaneous healing of early changes which later would perhaps lead to severe ulcers is found in the comparison of the percentage of patients in whom ulcers developed in other hospitals, where they were treated for the first six months after injury, and the number admitted to the Veterans Administration Hospital, Hines, Ill., less than six months after injury in whom ulcers developed. Of 67 patients received at the Hines hospital, 73% had sacral decubitus ulcers; 40% had trochanteric ulcers, and 4.4% had ischial ulcers. Fifteen per cent of patients were without ulcer. Of 32 patients admitted directly to the Veterans Administration Hospital at Hines, sacral decubitus ulcers developed in 3.3%.

The problem of bedsores in patients with lesions of the spinal cord and cauda equina presents a different picture from that seen in 1946 and 1947. In 1947, when the intensive effort to treat existing ulcers was well under way, about 30% of the patients with ulcers had rather extensive, undermined, and necrotizing lesions, usually in the sacral and trochanteric areas. At present, except in newly admitted patients, such extensive ulcerations are no longer observed. The ulcers now found are smaller and are usually not widely undermined. This is probably the result of careful inspection of critical areas by the patients themselves and by hospital personnel. The patient, as a rule, has sufficient information to understand the early signs of impending ulceration, such as persistent edema and abrasion. The patient and the hospital personnel are eager to prevent actual ulceration and to report such signs, the prompt preventive treatment being fully expected and actually received.

During the second world war, and immediately after the cessation of hostilities, numerous extensive ulcerations were accepted as an unavoidable exigency of war, but now the admission of one or two patients with signs of evident neglect produces consternation.

During the last two years an organized and closely checked effort has been made to determine the efficacy of conservative treatment of decubitus ulcers. The ulcers are measured every week and are dressed frequently in a properly equipped room by personnel trained in the technique of applying satisfactory dressings. All types and sizes of ulcers have been treated. The following agents have been applied or used: (1) soap and water, (2) hydrogen peroxide, (3) ultraviolet radiation, (4) zinc oxide ointment, (5) nitrofurazone (furacin®) ointment, (6) sulfathiazole ointment, (7) iodochlorhydroxyquin U. S. P. (vioform®) ointment, (8) petrolatum U. S. P., (9) thimerosal N. F. (merthiolate®), (10) bacitracin ointment, and (11) chlorophyll ointment and liquid.

The least effective agent was found to be sulfathiazole, and the most effective agent is generally agreed to be chlorophyll ointment and liquid. Of the ulcers treated conservatively, 23 per cent healed.

Ulcers presenting no tendency to heal under conservative treatment are operated upon. The operation usually entails the radical excision of the ulcer, including the underlying bone, and closure by primary approximation or by rotation of flaps and skin grafting. Ninety-six per cent of the ulcers operated on healed successfully. In 6% recurrences were noted in the surgical patients who were discharged from the hospital and who had to return. The causes of recurrence are believed to be as follows: carelessness on the part of the patient; trauma, such as may result from accidental friction and abrasion during falls, getting in and out of bed, automobiles, chairs, and other implements used in daily living; prolonged sitting; cross-country trips; unsuitable and ill-chosen labor activities, and associated alcoholism. A large percentage of recurrent ulcers healed under conservative hospital management. There is no evidence at present that intercurrent disease itself is associated with excessive formation of ulcers.

BLADDER

The most disastrous consequence of injury to the spinal cord in respect to mortality is the inability to urinate normally and the consequent infections of the genitourinary tract, leading to disease of the kidneys and uremia.

In the majority of cases the immediate consequence of injury was retention of urine or paradoxical incontinence, whether due to a spastic sphincter or paralysis of the detrusor muscle. Incontinence was present with only 5.5% of lesions of the first to the sixth thoracic segments, with 4.2% of lesions of the seventh to the 12th thoracic segments, and with 5.5% of lesions of the first lumbar segment and below.

The immediate treatment, as determined from a study of 199 patients, consisted of suprapubic drainage in 61, or 30.6%; of drainage by use of other continuous indwelling catheter in 86, or 43.3%; of intermittent catheterization in 29, or 18.1%, and of tidal drainage in 17, or 8.0%.

This distribution changed radically when definitive treatment planned for long periods was instituted. In April, 1946, when the patients at Vaughn General Hospital were transferred to the Veterans Administration Hospital, tidal drainage was being employed in 85% of the patients, and there remained only four patients with suprapubic drainage in 1947. A change in the function of urination had also occurred; as with reflex activities elsewhere, so in relation to urination, reflex activity of the bladder began and resulted in so-called automatic or autonomic function.

From a neurological standpoint, when a bladder, because of an increase in intracystic pressure, to an amount peculiar to each patient, resulted in reflex contraction of the detrusor and some emptying of the bladder contents, either an automatic or an autonomic bladder was stated to have developed. However, the development of such a reflex evacuation does not mean that it was adequate or that the patient by this means would avoid the necessity for forms of internal or external drainage. The amount of residual urine, the frequency of urination, or the susceptibility to infection under existing conditions led the urologist to define an automatic bladder in other terms, including almost complete emptying and no significant infection. This may be illustrated by a survey made by Dr. Benjamin Boshes in 1949, in which he found 80 cases of automatic bladder, whereas Dr. K. E. Barber found but 25 during the same year.

Automatic bladder function developed more frequently in patients with incomplete lesions (44%) than in patients with complete lesions (37%); of a special group of patients with recovering lesions it occurred in 51%. In 1947, when the material analyzed consisted of the older war injuries, an automatic bladder was found in 60% of patients. At that time some automatic function occurred with 38% of cervical lesions, with 62% of thoracic lesions, and with 70 to 75% of lesions of the lumbar segments, of the conus and cauda, and of the cauda equina. It appeared that the lower the lesion, the earlier the development of automatic function. This view was supported by the histories and interviews with 158 patients in 1950, when the range of time for its development with cervical lesions was 2 to 21 mo.; with thoracic lesions, 1 to 20 mo.; with lumbar lesions, 2 to 12 mo.; with lesions of the conus and cauda equina, 1 to 15 mo., and with lesions of the cauda, 1 to 9 mo.

Automatic function of the bladder is very capricious and can readily be disturbed, and even disappear, in the face of complicating genitourinary infections and other bodily disease and injury, and of hydronephrosis with high residual urine.

Only four of 29 patients with significant recovery of motion and sensation had recovered normal bladder function; of these, two had very good motor and sensory recovery, recovery being graded as ability to start the flow without abdominal compression, to empty the bladder and to stop urination at will. We found that no patient with any form of indwelling catheter could start urination, 80% of the 15 patients with automatic bladder function could feel or stop urination, but only two could start urination and 13% could start, stop, and feel urination, although not normally. Despite considerable recovery of motion and sensation, return of normal bladder function was rare.

It was early recognized that for the development of an automatic bladder, for training of bladder function, to insure sufficient activity for the patient's general welfare, and for treatment by a physical-medicine program it would be necessary to terminate any form of drainage as soon as possible. Such a plan was instituted.

Whereas in April, 1946, 85% of the patients studied intensively were on tidal drainage, in 1947 the figure was 29%; in 1948, 10.6%, and in 1950, 17.7%. However, the use of other forms of indwelling catheters became necessary as the result of genitourinary infections, fistulas, bedsores, surgery, intercurrent disease and injury, and hydronephrosis with high residual urine. In 1950, of a group of 158 patients studied, 33% had indwelling catheters, including those on tidal drainage and the Baumrucker program. In the three preceding years it was about 42%.

In 1948, about 50% of the patients wore some external device draining into a condom tube or other urinal. It was felt that these patients, including some with imperfect automatic bladders, were essentially incontinent, even if not continuously, and that under this condition they did not have residual urine, and therefore the procedure was less harmful than catheter drainage. However, improvement in the bladder function has increased, an earlier treatment of more recently injured patients has diminished the number in whom such devices are necessary, so that of 158 patients recently studied, 40% needed no device of any sort, whereas in 1948 only 4% needed none.

Although we had not been able to bring about that approximation to useful and safe function reported elsewhere, in addition to the changes in necessary impedimenta, some evidence of the success of management may be reflected from a comparison of the incidence of infections, stones, and necessity for cystoscopy. In 1946, 53.8% of the patients suffered from serious cystitis; in 1947, 48.8%; in 1948, 42.3%, and in 1949, 46.6%. In 1946 the mean number of infections per patient for that year was four; for 1947, three, and for 1948 and 1949 each, two. It must be remembered that new admissions of recent origin are being added to the colony. There were more cases of pyelitis in 1946; thereafter, the incidence remained almost the same. The same can be said of epididymitis and fistulas. In 1946, 35% of the patients had bladder stones; in 1946, 16.6%; in 1948, 16.3%; in 1949, 17.7%, and in 1950, 8.7%. The percentages for kidney stone were about the same. There were 224 cystoscopies in 1946, 118 in 1947, 88 in 1948, and 99 in 1950. (It may be of interest to note that 1,142 genitourinary surgical procedures were performed from April, 1946, to May, 1950.)

For psychological reasons, it had in former years been impressed upon the wounded veterans that they were disabled only by reason of their inability to walk and that otherwise they could be well and healthy men. This statement certainly is a deception. That it is a deception may be demonstrated from the results of autopsies. There have been 17 deaths among our patients; in 10 of these the cause of death was said to be uremia. In eight patients severe cystitis was found; in six, pyelonephritis; in nine, a pathologic condition of the kidneys including anemic infarct, nephrosclerosis (2), hemorrhage, acute contracted kidney, chronic passive congestion, degeneration of tubules, cloudy swelling, and subacute lipid nephritis; in one, abscess of the kidney; in three, amyloid infiltration of the kidney; in one, perirenal abscess, and in one, prostatic abscess and renal calculi.

This, of course, is not the whole picture, for in many instances, had not some succession of disasters to other parts occurred, the patient might have survived. Nevertheless, many die of disease of the genitourinary tract, and others, when the organism is insulted by disease or trauma, succumb to uremia, which in a normal man would not have occurred.

The development of an automatic bladder, bladder training, and the regulation of water intake, all are an important part of the management of spinal-cord injuries. Nevertheless, it must be remembered that "the bladder is a social convenience but the kidneys are essential for life."

Treatment of the neurogenic bladder produced by injury to the spinal cord cannot be described categorically. Even the general principles must be studied again and again before any uniformity of opinion may be brought about. Genitourinary complications succeed one another during the life of the patient, and one must be alert to them, to reexamine the patient at regular intervals even if other indications of disease do not manifest themselves, to change the method of management in accordance with the indications for a given patient or time, and, if the patient is to be discharged, to instruct him fully concerning his potential dangers and to put him in touch with a personal physician, hospital, or Veterans Administration hospital, so that early treatment for any complication may be instituted.

BOWEL CONTROL

As with the bladder, so with the bowel after injury to the spinal cord, voluntary emptying is impossible. This results in one of the very disabling sequelae of such an injury, not only in discomfort but in liability to infection of the bladder from bacterial contamination of bowel contents, and to injury. Regular periodic enemas were the rule after injury and were continued for a long period thereafter. Thus, in April, 1946, when the Veterans Administration assumed responsibility of the care of the patients, almost 100% of them were on an enema program. We soon felt that it was as important to bring about a state of automatic function of the bowel as of the bladder.

Immediately after injury, questioning of the wounded veterans elicited the information that 49% of those with cervical lesions had retention, and 51%, incontinence; 53% of those with thoracic lesions had retention, and 72% of those with lesions of the lumbar region or below had retention and 28% incontinence. These figures, derived from soldiers' statements, are misleading. The state of bowel action depended a great deal upon the consistency of the stool. When it was formed and by long retention became dehydrated and hard, "retention"—or, better, obstipation—occurred. When, for some reason, loose stools were present, as after catharsis, incontinence occurred; more extensive studies on the very early state are necessary before it can be said that a true retention occurs as frequently as is here reported. Since these reports deal with the early weeks after injury, tonicity of the sphincter, like tonicity of skeletal muscle, probably had not developed. It can be seen by comparing the tonicity of the external sphincter in the peace material with that in the war material, which consists of patients who had been injured a longer time before being examined than had the patients of the peace material, that a tonic external sphincter was present in 40% of the war material and in 80% of the peace material. With lesions of the cervical portion of the spinal cord, the external sphincter was spastic in both groups in about 90% of patients (in 87% of the peace material), with lesions of the lower thoracic region it was spastic in 30% of the war material and in 75% of the peace material. With lesions of the lumbar and lower levels, spasticity appeared in a smaller number, 23%. Some time after injury there is a relaxation of the tonicity of the external sphincter, and the condition differs from that originally seen.

As with the bladder, so with the bowel, some time later a reflex emptying may become possible. It becomes possible both with injuries of the spinal cord, in which a reflex contraction of the bowel musculature occurs and relaxation of the sphincter permits an evacuation, and with lesions of the cauda, in which an axonal reflex produces contraction of the bowel musculature and a patulous external sphincter allows the contents to escape.

Practically all the 244 patients studied in April, 1946, relied upon enemas for bowel evacuation. This necessitated a very large staff of attendants, who were kept busy, as in an assembly line, washing out the contents of the patients' lower bowel. The medical work on the ward was impeded; the morale of the patients was at low ebb, and an enormous quantity of supplies was necessary.

Aside from the patient's fear of soiling when traveling or on leave, the lack of confidence, the inconvenience and waste of time, and the time lost from healthful activities, the adverse effects of this program include the symptoms and signs and disturbance of other functions.

This is particularly true of patients with lesions in the cervical and upper thoracic portions of the spinal cord, in whom the increased autonomic reflexes result in hypertension, headache, profuse sweating of the face, chills, dizziness, and, in many, loss of consciousness. In addition, nausea, and at times vomiting, abdominal discomfort, anorexia, and increase of spasms and of burning pain were common to all levels of lesions. Moreover, in many patients disagreeable symptoms of ill-being persisted for one or more days, so that the patient was more or less continuously harassed by the results of the procedure. Accordingly, a program was instituted to teach the patient to accomplish emptying of the bowel first by reflex evacuation, with the later development of automatic function.

We already knew from a host of barium-meal studies that there was no impediment to the flow of barium as far as the large bowel. We also had learned from studying the appearance and retention of charcoal meals that there was a great delay in the passage of the stool along the large bowel, as well as the rectum, and that after the first appearance of charcoal a number of days could elapse before it completely disappeared from the stool. It was planned to develop reflex defecation first by stimuli designed to stretch the anus produced by the patient's finger, wearing a rubber cot.

It was found after much experimentation that, in order to initiate a successful bowel control program, lectures had to be given the attendants, nurses, and patients on the anatomy and physiology of the bowel. Demonstrations of gentle handling of the anal region and effective evacuation of the bowel following stretching of the rectal sphincter were given the attendants. This enabled them to start the method long before the patient could carry it out and facilitated the continuation of the bowel program while the patient was very ill or was recovering from operative procedures. The patient was also taught to use this method; his fear of an involuntary movement at home or in his car on the road was allayed, and he was convinced that incontinence would not occur. In those cases in which enemas had been taken for many months, there was at first a sluggish or no response to rectal stretching. However, as the tone of the rectal muscles returned, the patient noted greater ease in producing a bowel movement, and less time was needed to stimulate contractions. The patient was encouraged to use abdominal muscles, to strain moderately, or, if these muscles were paralyzed, to utilize manual pressure in association with the diaphragm to increase intra-abdominal pressure. As these manipulations became more efficient, many of the patients induced bowel movements merely by touching the area of the anus, and then gradually discarded the external stimulus as they acquired automatic defecation with the help of mild to moderate straining.

Except in one ward of about 50 patients, where the resident's chief interest at that time was the development of a bowel control program, in which the attendants and nurses cooperated with zeal, we were misled into believing that the program had been successful in 98% of patients. We have found out that in the other wards manual extraction had been resorted to in a number of cases without the knowledge of the ward physician. A more recent and enlightened investigation of 163 patients has shown that in 63% reflex bowel function has been effected. In 18% automatic bowel movements occurred. In 8% enemas were employed, and in the remainder manual extraction was resorted to. There is no doubt in our minds that the proportion of patients achieving reflex evacuation may be increased to 85%.

The time necessary to effect reflex evacuation varies. Of 16 patients with recent injuries, immediate results were obtained in seven when the injury had occurred two to four months before. For one patient eight months elapsed before it was effected, and for one, whose training began one month after injury, three months was required. With seven patients whose training began one to four months after injury, it had not yet become effective. A comparison of efficacy of training in war and in peace material in general suggests that reflex evacuation is easier to effect when longer periods since injury have elapsed, except in cases of injury of the lower thoracic and lumbar regions and below. The usual time for the war material was less than a month.

With the cervical injuries, it was effected in 75% of the war material and in 35% of the peace material; with injuries of the upper thoracic region, in 55% of the war material and in 25% of the peace material; with injuries of the lower thoracic region, in 55% of the war material and in 66% of the peace material, and with injuries of the cauda and conus and of the cauda alone, in 33% of war material and in 50% of peace material when the lesion was complete and in 100% when the lesion was incomplete.

Automatic bowel function occurred more frequently in the patients with considerable motor and sensory recovery. Of 13 such patients, four could start defecation. Of these, three could feel the passage of the bowel movement. This return of sensation is also present among some patients with automatic bladder function. None could interrupt defecation. As with the bladder, so with the bowel; very few achieve normal defecation, despite considerable motor and sensory return.

To change from use of enemas to automatic defecation may take only a few days, and this can be accomplished soon after the period of spinal shock.

The discontinuance of the enema management, although some patients resort to manual extraction, has been of great benefit to the patient and to the hospital. There has been a beneficial effect upon the morale of the patients; time has been freed them for useful occupation and treatment; appetites have increased, and all the complaints previously referred to have disappeared. For the hospital, it has made unnecessary the really tremendous number of linen articles and has made possible, along with other details of management, such as that of genitourinary complications, and bedsores, a considerable reduction in the number of attendants. Thus, in April, 1946 there were 179 attendants; in March, 1947, 140; in December, 1947, 130; in April, 1948, 120; in December, 1948, 113; in July, 1949, 106, and in January, 1950, 96. This decrease is related only to the lessened need for attendants.

RECOVERY

The potential recoverability of an injury to the spinal cord plays a part in the decisions concerning treatment and management of the patient.

Although at a time when there is paralysis of all motion and sensation no differentiation between complete anatomic section and complete physiologic interruption is possible, in some cases there is later a return of motion, sensation, and other functions. These functions begin to return at variable periods after injury, at times quite late. This observation is not in accord with the dictum that unless some function is found in the first 48 hours no useful function will return. It has been found impossible, from a study of posture and reflex activities to differentiate anatomic section from physiologic interruption. It is necessary to await some recovery of motion or sensation, and therefore those only who show such a recovery have partial lesions. When we, as well as others, have attempted to use posture and reflex activities as an index of completion of a lesion, many errors have been made.

Of 378 patients, some recovery was found in 93, or 24.6%; of sensory function in 89, or 21%, and of motion in 87, or 20%. Of the 87 patients recovering motion, 23, or 26.4%, had slight recovery; 39, or 44.8%, moderate recovery, and 28.8%, marked recovery. Of the 89 patients with sensory recovery, 18% had slight recovery; 45%, moderate recovery, and 37%, marked recovery. With lesions of the cervical portion of the spinal cord, there was a greater percentage of marked recoveries of sensory function than at other levels—51% of the cervical lesions, 16% of the thoracic lesions, 21% of the lumbar lesions, and 33% of the lesions of the conus and cauda. One therefore should be more cautious in respect to rhizotomy in the case of lesions of the cervical region.

The earlier the return of function, the better will be the recovery; thus, with respect to sensation, the median time for the first return of sensation for the whole group was three months, the range being from one week to a number of years. Patients whose recovery was slight showed their first return at a median period of six months; those with moderate recovery, at a median period of four months, and those with marked recovery, at a median period of two months. Sixty-one per cent of the patients with marked recovery, 33% of the patients with moderate recovery, and 31% of the patients with slight recovery showed beginning return in two months or less. However, marked recovery resulted even if the first return was as late as one year.

In regard to motion, 22% of patients with final slight recovery, 47% of those with moderate recovery, and 79% of those with marked recovery had their first return of motion at two months or less, although marked motor recovery occurred when the first return was as long as five months after injury. This indicates that even if recovery of motion or sensation does not occur within a few days, unless the lesion is proved to be a complete anatomic section, recovery may still begin some months after. As an indication of what was considered marked motor recovery, we may mention ability to walk without braces or crutches, or without crutches, or with the aid of braces or cane only, or full recovery of one extremity, or of motion in the thighs and legs, but not of the feet, and, finally, ability to walk without cane, crutch, or braces.

It is of interest to note here that in 36, or 37% of the 93 patients, psychic erection was possible and emissions occurred in 17, or 17%. A sensation of orgasm was present in 14, or 14%. This recovery was unrelated to recovery of bladder and bowel function, at times occurring with the latter, at times independently.

PHYSICAL MEDICINE AND REHABILITATION

A program for physical medicine and rehabilitation is one of the most important parts of the management of the residuals of injuries to the spinal cord and cauda equina.

It contributes to the general well-being of the patient at a time when treatment may be limited to bed activities, and it becomes progressively useful as time and achievement develop. It has been found to be beneficial in increasing appetite, weight, and general strength; in improving circulation, probably in preventing the further development of bedsores, both because dexterity of movement in avoiding injury is developed and a good state of health is promoted. Likewise, it is held valuable in preventing formation of calculi, in diminishing genitourinary infection and in improving bowel action. Nothing contributes more to the morale of the patient, and, as will be seen, the independence brought about by dexterity of movement is the most important factor in the approximation to normal activities.

With the purpose of bringing out certain general principles, 549 patients with lesions of the spinal cord and cauda equina were treated in the physical medicine and rehabilitation service, and the results were analyzed. The patients were divided into two main groups, those with lesions of the cervical portion of the spinal cord, exhibiting paralysis of the lower extremities, as well as of various parts of the upper extremities, and those with lesions below this level—the thoracic and lumbar regions, and the conus and cauda, with paralysis only of the lower extremities and various levels of the trunk. Of the former there were 96 patients, and of the latter, 453. The latter consisted of 327 patients with lesions of the thoracic segments, 106 with lesions of the lumbar portion of the spinal cord, and 20 with lesions of the cauda equina.

In evaluating achievement, a rearrangement of the Veterans Administration's form 10-2555, "My Own Score," served as an index of correction of dysfunction of such activities as were brought about by the injury.

A point system was devised categorically, certain values being assigned to different activities, first for lesions of the cervical region and then for lesions below that level. It is obvious that in case of the latter no credit should be given to certain activities, such as eating and shaving, when the lesion is in the dorsal portion of the spinal cord, and it is equally obvious that it is harder for a patient with a lesion of the cervical portion of the spinal cord to achieve practically all such activities as putting on clothes, propelling a wheel chair, and ambulation, and endurance activities.

What of patients with lesions of the cervical portion of the spinal cord? To the activities collected as Group 1, described as bed activities, with or without the assistance of such devices as splints, cuffs, enlarged grips and holding devices, and counterbalances, a score of 10 points was given when the item was fulfilled. These achievements, which included shaving, eating, and washing, can be performed even though the patient is confined to bed. Logically, those with injuries below the spinal cord were given no credit for such activity.

The activities of the next group in order of progression were those of hand and wheel chair activities, and for their accomplishment 20 points was allotted. The third group consisted of activities related to ambulation on the level ground and erect position activities, and 30 points was allocated to them. The last group, described as "ambulation with elevations and endurance activities," constituted an additional 40 points, making a total of 100 points.

In the case of injuries below the cervical portion of the spinal cord, patients who were trained in the activities in Group 2 were given 15 points; those who could perform Group 3 activities were allotted 25 points, and those who achieved performance in Group 4 activities were awarded 35 points, making a total of 75 points.

The difference in the total points allotted to these two groups was due both to the unallowed credit for activities in the upper extremities in the patients with injury below the cervical region and to the weighting somewhat higher of all the activities of patients with cervical injury, since it is more difficult for patients with paralysis of parts of the upper extremities to perform any activity.

Because of the frequent assumption of the futility of any attempt at restoration of function, or substitution therefor, in the upper extremities when the cervical portion of the cord is injured, the statistics of achievement in cases of lesions at this level are of interest.

Of 96 patients with such lesions, 19, or 19.7%, performed all required possible activities; 24, or 25%, all activities of Groups 1, 2, and 3; 29, or 30.2%, activities of Groups 1 and 2, and 17, or 17.7%, activities of Group 1. In 7, or 7.2%, no rehabilitation was effected. It should be recalled that Group 1 consisted of hand activities, and that Group 2 required eight activities limited to the upper extremities and 16 to the trunk, as well as the upper and lower extremities. Moreover, for the completion of activities of Groups 3 and 4, the upper extremities play a large part in the successful use of braces. These results indicate that the outlook for these patients is not as discouraging as it would seem on casual consideration, and that, as in anterior poliomyelitis, reeducation is successful and substitution of useful function possible.

Does the level of the lesion play any part in the final achievement? In comparing the percentages of patients with lesions at various levels who achieved full activity, (that is, 100 points for cervical lesions and 75 points for lesions at other levels), one finds that 19% of patients with cervical lesions, 32% with thoracic lesions, 62% with lumbar lesions and 70% with caudal lesions accomplished full achievement. Complete achievement was greater as the level descended.

The time required for this accomplishment was an average of 9 mo. for cervical lesions, 7.2 mo. for thoracic lesions, 6.2 mo. for lumbar lesions, and 4.5 mo. for lesions of the cauda equina. The lower the level, the shorter the time necessary for complete rehabilitation.

Is rehabilitation effected with greater ease when the lesion is incomplete? By computing the average of the total points for patients with lesions at various levels and comparing the average for complete lesions with that for incomplete lesions, the following figures are obtained:

Of 96 lesions of the cervical region of the spinal cord, the average for 18 complete lesions was 0.7 point, and the average for 78 incomplete lesions was 54 points. Of 327 lesions of the thoracic portion, the average for 194 complete lesions was 52 points, and that for 71 incomplete lesions was 133 points. Of 106 lesions of the lumbar portion of the spinal cord, the average for 38 complete lesions was 47 points, and that for 78 incomplete lesions was 82 points. Of 20 lesions of the cauda equina, the average was 73 points for three complete lesions and 74 points for 17 incomplete lesions.

Greater degrees of rehabilitation are possible when the lesion is incomplete. In the case of pure lesions of the cauda equina the number is too small to be statistically significant. The chief complications regarding full accomplishment of rehabilitation are decubitus and other ulcers, spasms, contractures, and genitourinary complications.

Fourteen patients, or 14.5%, with cervical injuries; 61, or 20%, with thoracic injuries; 27, or 27.3%, with lumbar injuries, and 2, or 10%, with lesions of the cauda equina, a total of 104, or 18.8%, had decubitus or other ulcers.

With lesions of the cervical region, the average time required to obtain 100 points was 36 mo. when ulcers were present and nine months when they were not. For 60 points, the average was 17 mo. for patients with ulcers and eight months for those without; for 30 points, the average was 12 mo. for patients with ulcers and 4.2 mo. for those without; for 10 points, the average was 31 mo. for patients with ulcers and 3.7 mo. for those without. With thoracic lesions of the cord, the time required to achieve 75 points was 2.2 mo. for patients with ulcers and 7.2 mo. for those without; to achieve 40 points, 19 mo. for patients with ulcers and nine months for those without; to achieve 15 points, 14 mo. for patients with ulcers and 3.6 mo. for those without. With lesions of the lumbar segments, the time required to achieve 75 points was 19 mo. for patients with ulcers and seven months for those without; to achieve 40 points, 16 mo. for patients with ulcers and five months for those without; to achieve 15 points, 12 mo. for patients with ulcers and 2.5 mo. for those without.

Spasms delayed rehabilitation to about the same degree in nine patients with cervical lesions, 33 patients with thoracic lesions, and 15 patients with lumbar lesions, a total of 57 patients, or 10.3%.

Contractures also delayed rehabilitation to about the same degree in 15 patients with cervical lesions, 18 patients with thoracic lesions, and 11 patients with lumbar lesions, a total of 44 patients, or 8.2%. The distribution of genitourinary complications was as follows: 15 patients with cervical lesions, 11 patients with thoracic lesions, and 6 patients with lumbar lesions, a total of 32 patients, or 5.8%. In the group of 549 patients, 222 lesions were produced by gunshot wounds, and 257 by fracture dislocations, and 70 were due to causes not related to injury. No statistically significant difference in ease or degree of rehabilitation was effected among the three groups.

A comparison was made of the rehabilitation effected when the patient had been injured under battle conditions and subjected to treatment limited by the conditions of war, and the rehabilitation effected when the patient had been injured under conditions comparable to civilian life and had then found his way to this hospital. It was found that the civilian type of patient attained effective levels of rehabilitation in a shorter time than the patient injured in battle. It may be possible that the civilian patients were not subjected to complicated wounds and that they received definitive treatment earlier. It is also true that the time after injury plays an important role in final achievement.

A rehabilitation program was started with 207 patients six months or less after injury. Injuries occurred under conditions of civilian life in 154 of those patients, and in battle, in 53. It was consistently found that the earlier the veteran was started on a physical-medicine and rehabilitation program, the better were the results and the less the time required to achieve them. Therefore, the most important difference between battle and civilian conditions is the lapse of time between injury and institution of a physical-medicine and rehabilitation program.

It is of interest to conclude with some figures beyond those concerned only with the achieving of successful movement. Of 78 patients who have been discharged, 22 are in college; 28 are in trade schools; 24 are self-employed, and 4 are employed by others. In the hospital, 10 additional patients received college credit; 22 received high-school diplomas, and 39 were engaged in various avocations.

STATE OF GENERAL HEALTH

In earlier reports, attention has been called to widespread hypoproteinemia, reversal of the albumin-globulin ratio, severe secondary anemia, and amyloidosis.

The occurrence of such states of ill-health varies in respect to time and to where and how the patients are treated. In April, 1946, when we assumed responsibility for the care of these patients, there was a significant number of abnormal albumin-globulin ratios; there were no significantly low amounts of total protein or hemoglobin or of low red blood cell counts. Only 11% of the patients had a red blood cell count of less than 4,100,000, and less than 3% had hemoglobin of under 12 gm. per 100 cc. In about 24% the total protein was less than 6.55 gm. In April, 1946, 46.6% showed an albumin-globulin ratio below 1.5, and 12.4%, a reversal. In April, 1946, only 1% had a ratio above 3.0, and this rose to 30% by July, 1946, the number thereafter diminishing and disappearing. In some instances the diminution of globulin was astounding, in some falling as low as 0.4 gm. per 100 cc. The percentage of albumin-globulin ratios below 1.5 diminished as the months elapsed. In 1949, in most instances the albumin-globulin ratio had assumed a normal value.

In 1948, in 1,172 determinations on 150 patients, significantly low levels of total protein occurred in only 4% of the 150 patients. In only 14 patients was there evidence of a mild hypochromic microcytic anemia.

Some indication of the general state of health may be derived from noting the loss of weight, which is constantly found in these cases. A group of 86 patients were studied with respect to the loss of weight, the time at which the peak of loss of weight was reached, and the amount of weight recovered.

The loss of weight ranged from 10 to 120 pounds (4.5 to 54.4 kg.). The mean loss of weight was 55.6 pounds (27.8 kg.). Twenty-five per cent lost 70 pounds (31.8 kg.) or more. The time when the peak of loss of weight occurred ranged from one month to one year, except for four patients, who continued to lose weight.

The mean time was five months. In one case there was a loss of 70 pounds (31.8 kg.) in the first five weeks.

Treatment devised to improve the physical well-being of the patients resulted in some of the lost weight being regained. The range of weight regained was from 0 to 90 pounds (0 to 40.8 kg.), with a mean gain of 28.71 pounds (14.4 kg.). Five patients regained no weight but did not continue to lose, and four continued to lose weight; four gained more weight than they had lost. The terminal loss of weight ranged from 0 to 80 pounds (0 to 36.3 kg.), with a mean of 31.56 pounds (15.8 kg.). There was no correlation between level of the lesion or injuries of war and peace and the loss of weight.

In a small number of patients ultimately having significant recovery of motion and sensation, the initial loss of weight was less than in the other patients. The lessened indications for transfusions noted elsewhere as years elapse also emphasizes the poor state of health seen originally. Thus, in 1946 there were 569 transfusions of blood and plasma, and in 1949, 249 transfusions.

Attention should be called to the state of ill-being produced by dysregulation of metabolic disturbances and changes in autonomic reflex function when the injury occurs in the cervical and upper dorsal segments. In such cases, diabetes insipidus occurs. Temperature regulation is disturbed, and pyrexia results in hot weather. Because of uncompensated orthostatic hypotension numerous instances of loss of consciousness are noted on changes from the horizontal to the vertical position. At times, abdominal binders are of assistance, and in most instances some autonomic control returns, and the incidence of unconscious states diminishes. Reflex hypertension from distended bladder or rectum and from enemas results, and headache, faintness, and dizziness are often reported. There is evidence that sugar metabolism is disturbed, and it is probable that disturbance of other metabolic functions will be found. There was no disturbance in hunger, appetite, thirst, satiation, or thirst or hunger as the direct result of the injury at any level. A study of the cause of death likewise gives an indication of the resulting lesion. There were 17 deaths among 767 patients admitted, or 2.2%.

Of the 17 patients who died, autopsy was performed on 11, and detailed postmortem reports are available. The causes of death of the 17 patients as listed on the death certificates were as follows, in order of frequency: pyelonephritis, 11 patients; uremic poisoning, 10; bronchopneumonia, 4; hemorrhagic cystitis, 2; ulcerative colitis, 2; pyonephrosis, 1; meningitis, 1; hepatorenal syndrome with vascular collapse, 1; coronary occlusion, 1, and rheumatic heart disease with mitral stenosis and mural thrombi, 1. In the 11 patients on whom autopsy was performed, gross pathologic findings were recorded and are listed in order of frequency of the organs involved (in addition to the primary lesion of the cord): in the lungs, 11 patients; in the liver, 10 patients; in the kidneys, 8 patients; in the bladder, 8 patients; in the skin (decubitus ulcers), 7 patients; in the prostate, 5 patients; in the heart, 5 patients; in the bones (osteomyelitis), 5 patients; in the stomach (gastritis, ulcers), 3 patients; in the testes, 3 patients; in the large intestine, 2 patients; in the small intestine, 1 patient, and in the esophagus (varices), 1 patient.

It is interesting to note that amyloidosis was found in three patients with traumatic paraplegia. In all three patients both the liver and the spleen were involved, and in one the testes also showed amyloidosis, with complete absence of spermatocytes.

The cause of death is usually attributed to infection, especially of the urinary tract, and terminally of the lungs. In practically all cases of injury to the spinal cord, infection of the genitourinary tract exists in a mild or severe degree. This occurs despite the routine use of antibiotics and the careful nursing care and supervision of the genitourinary complications. Why should a few of these patients, all of whom have infection of the genitourinary tract, die? Is it true that their death is due directly to such an infection of the urinary tract, or are there other causative factors in the evolution of their disorder, and complicating diseases, which lead to the terminal state of uremia?

In some cases the successive events in the evolution of disorders is clearly related for the most part to the genitourinary tract. For example, the following successive episodes occurred in different cases: nephrectomy, pyelonephritis, uremia, death; or, cystitis, pyelitis, periurethral abscess, urethral fistulas, nephritis, secondary anemia, anasarca, pleural effusion, uremia, death; or, nephrectomy, nephrolithiasis, perirenal hemorrhage, bronchopneumonia, uremia, death; or, nephrolithiasis, pyelonephritis, urinary suppression, anasarca and ascites, uremia, death.

In other cases, disasters occurred in other parts and led to death, the immediate cause of which was the failure of the kidney because of previous episodes. This may be illustrated by such successions of events in different patients as hemopneumothorax, abscess of the lung, nephrolithiasis, perirenal abscess, anasarca and ascites, death; or, pathologic fracture, rhizotomy, sprue, hypoproteinemia, ileocolitis, nephritis, death; or, hypoproteinemia, repeated genitourinary infections, nitrogen retention, hepatorenal syndrome, vascular collapse, death; or, irreversible secondary anemia, pleural effusion, nephritis, uremia, death.

In some cases, the death was not related to the genitourinary tract, as in the following: Onset of recurrence of rheumatic heart disease, jaundice, auricular fibrillation, congestive failure, death; or, chordotomies, osteomyelitis, chronic pancreatitis, death.

An analysis of the clinical histories of the patients who died shows that in most instances they were subject to more than infection of the genitourinary tract. Many of them had had recurrent attacks of sepsis. Most of them had undergone several surgical procedures. Severe decubitus ulcers, osteomyelitis, heart lesions, pulmonary disease, gastrointestinal complications, and general nutritional disturbances were encountered. It may be seen from the aforementioned cases that when the terminal picture was that of uremia due to renal failure other factors often contributed to such an outcome.

The importance of this approach to the problem of the "cause of death" lies in the calling of attention to appropriate measures in planning the best program of care for paraplegic patients. In addition to the use of antibiotics and to careful routine and repeated studies of the genitourinary tract, attention is called to the general bodily status of the patient, his nutritional state, his reactions to surgical procedures, and his organs of defense concerned with antibody and resistance elements, such as the spleen and reticuloendothelial system.

ADMINISTRATION

The Center at the Veterans Administration Hospital, Hines, Ill., having a total bed capacity of 300, was first opened April, 1, 1946. It occupies 12 wards of 25 beds each. Most of the patients are placed in large wards. There are a number of private rooms; these are reserved for patients who are critically ill. It has been found that patients do much better in large wards than in private rooms.

The early problems in the treatment of spinal-cord injuries as a result of war injuries were different than those concerned with spinal-cord injuries as a result of civilian injuries. The patients with war injuries came to us with acute conditions, such as anemia, hypoproteinemia, bladder infections, calculi, tidal drainage, decubitus ulcers, malnutrition, and amyloidosis. These problems required a large nursing and attendant staff. As the result of improved and continued treatment of bedsores, bladder and bowel control and general health, the numbers necessary diminished. In April, 1946 there were 118 nurses and 179 attendants; in March, 1947, 106 nurses and 140 attendants; in December, 1947, 78 nurses and 130 attendants; in April, 1948, 92 nurses and 120 attendants; in December, 1948, 58 nurses and 114 attendants; in July, 1949, 50 nurses and 106 attendants, and in January, 1950, 44 nurses and 96 attendants.

By the end of 1949, only 34% of the patients had sustained injury as the result of war, 66% being in the hospital for civilian injuries. The civilian patients had fewer complications than patients with spinal-cord injuries resulting from war wounds, thus requiring less personnel; this also contributed to the decreased need for as large a nursing and attendant personnel. Another indication for the need of a smaller personnel now than in 1946 may be found in comparing the numbers of transfusions given patients with spinal-cord injuries for medical conditions, such as anemias and hypoproteinemia, but not for surgical conditions, in 1946 with those at the present time. In 1946, after April, there were 569 transfusions; in 1947, 516; in 1948, 297, and in 1949, 244.

Disciplinary Boards.—After the change from Army to Veterans-Administration control, a feeling of almost arrogant independence developed in the patients, who felt that they were protected by public clamor and political favor, combined with the fact that they were free from Army discipline and punishment under the Articles of War. In addition, a firm Veterans Administration policy for violations had not been developed, in spite of the efforts of the Manager to enforce the regulations. As a result, disciplinary problems began to increase and were present almost daily. The greatest problem at that time was alcoholism, and, to a less extent, gambling. Not infrequently, the patients became openly abusive of members of the ward personnel, and occasionally there were altercations among the patients themselves. Gradually the situation began to improve with regard to alcoholism as a result of constant enforcement of all violations by the restriction of passes for varying lengths of time—from one to three months. Alcoholism is still present among a few chronic offenders and crops up occasionally in cases of readmission of old patients. There is a more or less general use of alcoholic beverages on the part of almost all patients while on pass or leave from the hospital, more for social reasons than because of addiction.

Although this problem is still present, violations are infrequent and are confined largely to the winter months, when driving is hazardous and the patients are unable to move about freely, outdoors, in their wheel chairs.

Car Driving.—When automobiles for service-connected patients were authorized, a training program was instituted to teach the patients to drive; and when they became proficient, they were permitted to drive their own cars and were licensed by the state. There were a number of instances of patients who, without permission of the Veterans-Administration driving school, acquired licenses by going to nearby towns. At first there were a number of automobile accidents, in excess of those in the general public, but at this time the situation has improved to the point where there are very few. The proficiency and ability of individual drivers have improved greatly with the lapse of time.

Games.—Games in which patients with spinal-cord injuries can injure themselves are not permitted. For example, basketball games are a dangerous sport in that a patient may sustain a fracture or acquire a decubitus ulcer as a result of friction. Our patients were prohibited on medical grounds from participating in the championship basketball games that were touring the country last year. They have the facilities of a large gymnasium, where they can practice archery, bowling, and other harmless sports.

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ABSTRACT OF DISCUSSION

Dr. L. W. Freeman, Indianapolis: Only a few years ago, opinion was strongly entrenched to the effect that few paraplegics could be expected to survive the many complications facing them, and those who did could look forward to little more than a parasitic life. The second world war altered that concept, when the Surgeon General began to make special provisions for their care. Thus, men like Bors and Kuhn were able to evolve centers for special care. Some of these were remodeled and expanded before being turned over to the Veterans Administration. That these centers have been maintained, and even improved, as is indicated by the present paper, is a tribute to the insight and ability of Hawley and Magnuson. The most important factors in the success of this type of case handling have been the segregation of the patients, the establishment of the wards at a department level, and the integration of specialty services. To illustrate Dr. Pollock's reticence in recording his actual achievements, buried in the statistics presented, I should like to point out that it was some of his own patients who initiated the drive to make the excellent care they received available to the civilian paraplegic. It was to this end that they, the veteran paraplegics, formed and incorporated in the State of Illinois the National Paraplegia Foundation, on whose medical advisory committee I have the privilege of serving. Dr. Pollock has emphasized the need for a cautious approach to the various complications. One must not, however, fall into the fallacious idea that operative techniques are radical, for often they are the only method of conserving life. Functional regeneration after transection of the spinal cord has been observed in the rat, the cat, and the dog. In our laboratories, we have transplanted spinal nerve roots, with functional return, in the dog and the primate. The possibilities of application of such techniques are presently under study. [Slide.] I show a gross anatomic picture of a plasma-clot suture of spinal nerve roots in a primate. Stimulation of the proximal end gave a peripheral muscular response, and the microscopic sections showed a liberal downgrowth of fibers to the muscle. It should be pointed out that the roentgenographic demonstration of laminar fractures and intervertebral disk protrusions is unreliable, making early and careful laminectomy the most conservative therapy possible in regard to the preservation of spinal-cord structure. Moreover, many poorly functioning neurogenic bladders are amenable to selective neurosurgical procedures.

IMPROVED TECHNIC FOR DIAGNOSING RINGWORM INFECTIONS AND MONILIASIS

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and
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Although superficial fungus infection of the skin is a common disease, it has been our experience that diagnosis of the condition is often made on the basis of inadequate evidence. Ringworm, especially of the feet, is a popular diagnosis among both physicians and laymen. The diagnosis is usually based on brief clinical inspection without resort to confirmatory laboratory procedures.

A false diagnosis of ringworm carries the hazard of exposing the patient to therapeutic attacks that at best may not be helpful, and at worst may be damaging. We have repeatedly had the opportunity to observe patients with various types of contact dermatitis who have received the wrong treatment, often with great harm to themselves, because of a clinical misdiagnosis of ringworm. On the other hand, the failure to make an accurate diagnosis, particularly in the more resistant cases such as ringworm of the nails, entirely precludes rational therapy.

Confirmation of a diagnosis of ringworm is afforded by two laboratory procedures: (1) culture of the organism; (2) microscopic demonstration of the fungus in tissue. Although isolation of the organism in culture is often helpful in prognosis, this procedure can scarcely be recommended to the busy general practitioner. Moreover, even when good laboratory facilities are available, attempts to isolate the organism are successful in only 40 to 60% of the microscopically proved cases of ringworm. Therefore, microscopic examination of skin scrapings is a more feasible and valuable diagnostic technique. The simplicity of this examination also recommends it.

The fungi causing superficial skin disease grow in the horny outermost stratum of the epidermis. They appear in this dead substratum in the form of branching threads or filaments (hyphae). They are considerably larger than bacteria. The organism that causes moniliasis (Candida albicans) shows yeastlike forms (budding cells) as well as hyphae. The microscopic detection of a filament or even a small fragment of a filament in a skin scraping is sufficient to establish a diagnosis of superficial fungus infection.

Up to the present time the potassium hydroxide preparation has been the accepted procedure for demonstrating fungi in the skin. This technique requires that the skin scrapings be mounted in a drop or two of 10% potassium hydroxide on a slide. Although the hydroxide solution serves to clear the tissue and thus increases the visual contrast of the fungus, the value of this method is nonetheless limited because the preparation is colorless. The differentiation of artifacts such as the "mosaic" fungus (not a fungus at all) is often difficult. Moreover, fungus elements are exasperatingly scarce in some specimens, and 15 to 20 minutes of close scrutiny by a skilled observer may be required to detect the organism in an unstained preparation.

In previous communications, the Hotchkiss-McManus stain has been recommended as a superior method of demonstrating fungi in tissue.[1] The two fundamental steps in this procedure are treatment of the skin scrapings on a slide with 1% periodic acid [2] followed by exposure to the Schiff reagent (decolorized basic fuchsin). The necessity of using the Schiff reagent limits the value of this technique for routine work because of the relative instability of the solution. Schiff reagent is not readily prepared and usually has to stand overnight before use. Arzac [3] has succeeded in modifying the Hotchkiss-McManus stain so that ordinary basic fuchsin solution is used instead of the Schiff reagent. This is advantageous because basic fuchsin solution is stable. Both the Hotchkiss-McManus technique and Arzac's modification are general stains for various substances belonging to the class of complex polysaccharides. These stains are in no sense specific for fungi. Our interests, however, have been confined to the adaptation of these procedures to the specific purpose of demonstrating fungi. In particular, the aim of the present study has been to develop a modification so simple as to make this procedure an available diagnostic tool for routine use. The method to be described may be readily employed in clinic and private practice wherever routine diagnostic laboratory procedures are being performed. Specifically, it has been

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From the Department of Dermatology and Syphilology, University of Pennsylvania School of Medicine, D. M. Pillsbury, M.D., Director.

[1] Kligman, A. M., and Mescon, H.: The Hotchkiss-McManus Stain for the Histopathologic Diagnosis of Fungus Diseases, *Am. J. Clin. Path.* 21:86, 1951; The Periodic Acid-Schiff Stain for the Demonstration of Fungi in Animal Tissue, J. Bact. 60:415, 1950.

[2] Periodic acid is manufactured by the G. Frederick Smith Chemical Co., Columbus, O.

[3] Arzac, J. P.: A Simple Histochemical *Reaction for Aldehydes,* Stain Technol. 25:187, 1950.

found very useful in the diagnosis of dermatophytosis of the feet, tinea corporis, tinea capitis, onychomycosis (ringworm of the nails), tinea versicolor and moniliasis.

METHOD

The method of collection of material is most important. Preferably, a drop or two of Mayer's glycerol albumin (purchasable from any supply house) is placed directly over the lesion. The lesion is then vigorously scraped with a blunt knife. The albumin causes the scrapings to stick to the knife, and also accomplishes the removal of the horny material in the form of macerated, thin shavings. It is essential that thick pieces be avoided. The macerated material on the knife is then transferred to a slide and rubbed over the surface so as to effect an even distribution. The albumin also enables adherence of the material to the slide during the staining procedure. Slides prepared in this way can be shipped by mail and stained without loss of brilliance weeks later, if necessary. Scrapings from nails may be collected in the same manner, although more vigorous scraping is required. Whenever possible in cases of onychomycosis, horny material under the nail should be collected. The likelihood of a positive result in onychomycosis is greatly improved by the collection of a copious amount of material since fungus elements may be very scarce.

Comparison of the Potassium Hydroxide Method with the Basic Fuchsin Staining Technique in Suspected Cases of Superficial Fungus Infections

Condition	No. of Patients Examined (in Suspected Cases)	No. of Positive Diagnoses from Stained Preparations	No. of Positive Diagnoses from KOH Preparations	No. of Positive Diagnoses from KOH Preparation but not in the Stained Specimens	No. of Positive Diagnoses from Stained Preparations but not from the Potassium Hydroxide Specimens
Ringworm of the glabrous skin and the feet	164	47	39	0	8
Fungus infection of the nail	22	13	9	1	5

On the other hand if the laboratory receives the material in the form of thick pieces of nail or the tops of vesicles, it is necessary to scrape these specimens with a sharp knife so as to procure a thin smear. In the latter case the slide should be prepared beforehand by smearing a drop of Mayer's glycerin-albumin over it. The thin scrapings are then rubbed over the slide as before.

In suspected cases of moniliasis of the mouth or vagina, the swab used to collect the sample is simply rubbed over an albuminized slide. The following procedures are best carried out in a series of Coplin staining jars that may be permanently set up for routine use:

1. Immerse the slide for one minute in 95% alcohol, immerse it for five minutes in a 5% aqueous solution of periodic acid.
2. Transfer it to the following solution for two minutes:

Basic fuchsin	0.1 gm.
95% ethyl alcohol	5 cc.
Water	95 cc.

(Dissolve the basic fuchsin in the alcohol and then add the water.)

3. Rinse briefly in tap water.
4. Immerse in the following solution for 10 min.:

Zinc hydrosulfite	1.0 gm.[4]
Tartaric acid	0.5 gm.
Tap water	100.0 ml.

This solution is stable for at least one month if it is kept in a closed jar, and can be used over and over again. It may be conveniently kept in a stoppered bottle and poured into a Coplin jar just before use, or a screw-cap type of Coplin jar may be used. Zinc hydrosulfite is a white powder and a fresh solution can be prepared in a few minutes. The freshly prepared solution contains finely dispersed sulfur which, however, does not interfere with immediate use. Within 24 hours the sulfur will have settled to the bottom, leaving a clear solution. Removal of the sulfur by filtration is not required. The solution is usable as long as it continues to have a strong smell of sulfur dioxide.

5. Rinse the slide briefly in water.
6. Dehydrate and mount. Immerse in 95% alcohol, absolute alcohol, xylene, and a final xylene solution, for one minute, in each, and mount in balsam or HSR[5] mounting medium. Preparations prepared in this fashion are permanent and may be filed. If semipermanent preparations are satisfactory, the specimen may be mounted in a drop or two of polyvinyl alcohol mounting medium immediately after step 6. This eliminates the necessity of dehydrating and clearing; however, the color of specimens mounted in polyvinyl alcohol begins to fade after a few days. The polyvinyl alcohol mounting medium can be prepared according to the directions given by Huber and Caplin.[6] If the specimen is to be examined the day of preparation or on the next day it may be mounted in ordinary glycerin directly after step 6. This is the simplest procedure if, as is usual, the slides are to be disposed of shortly after inspection. Mounting in glycerin is recommended for routine use since this eliminates the several steps required to dehydrate and clear the specimen.

RESULTS

The fungi are stained red. The horny tissue is either colorless if fairly thin, or light red if thick. Even in thick smears, however, there is sufficient contrast between the fungi and the keratin to afford ready detection of the fungus.

For the past six months this technique has been in routine use in the dermatology clinic of the Hospital of the University of Pennsylvania. As a basis of comparison, the potassium hydroxide method has been done in parallel on each specimen. The clear-cut superiority of the stained slides is demonstrated by the evidence presented in the Table. The advantage of this method lies not only in permitting a higher percentage of positive diagnoses but also in the brief time required to find the fungus in a positive smear. These advantages offset the time and effort required to stain the preparation. The staining method is, however, a much more complicated one than the potassium hydroxide procedure.

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[4] Zinc hydrosulfite may be obtained from the Virginia Smelting Co., West Norfolk, Va.

[5] Harleco synthetic resin (HSR) is obtainable from the Hartman-Leddon Co., Philadelphia.

[6] Huber, W. H., and Caplin, S. M.: Simple Plastic Mount for Permanent Preservation of Fungi and Small Arthropods, Arch. Dermat. & Syph. 56: 763 (Dec.) 1947.

COMMENT

It may be observed that there was only one instance (a case of onychomycosis) in which fungi were demonstrated by the potassium hydroxide method and not in the stained smear. Nonetheless, it is precisely in cases of fungus infection of the nail that the staining method has proved most valuable. Not infrequently, even when abundant material has been collected on several slides, only a single fungus fragment may be present. This fragment is readily missed in an unstained preparation. It should also be pointed out that in scrapings from cases of onychomycosis the fungus elements are often in a degenerated state so that they do not stain as brilliantly as the organisms found in glabrous skin lesions. One may observe from the Table that if the potassium hydroxide method alone had been used in cases of ringworm of the skin and feet, about 17% of the positive cases would have been missed.

The staining method has particular value in the diagnosis of moniliasis. We have been repeatedly surprised by the large quantity of organisms observed on the stained slide when the potassium hydroxide preparation of the same specimen showed a paucity of fungus elements. Brilliant preparations result from material collected in cases of moniliasis of the mucous membranes. The method should be particularly valuable to gynecologists for the detection of monilial vaginitis.

One should be aware that the skin supports as part of its normal flora a group of budding yeastlike fungi. These are mainly the so-called lipophilic fungi belonging to the genus Pityrosporum (including Pityrosporum ovale, the "bottle bacillus," falsely implicated as a cause of dandruff). These normally occurring organisms should not be confused with the organism causing moniliasis (C. albicans). The lipophilic fungi are much smaller, and exhibit only round or oval budding cells, never hyphal threads.

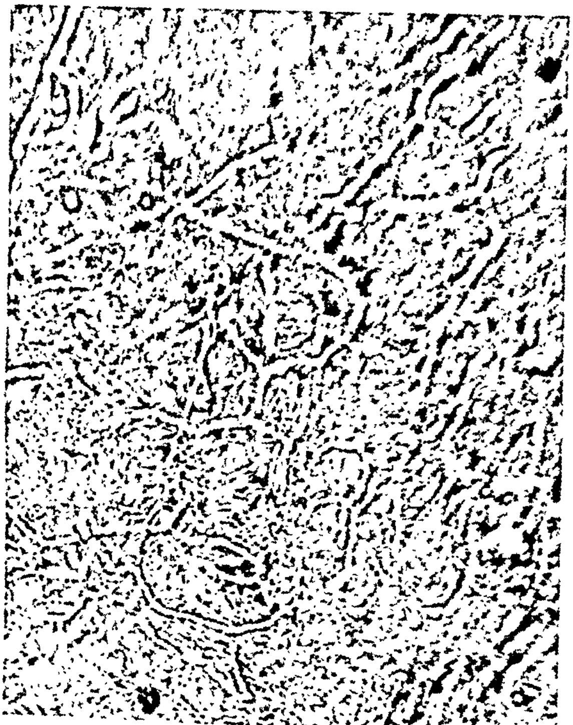

Fig. 1.—Potassium hydroxide mount from a case of ringworm of the skin. The fungus threads are poorly defined.

The fungus in cases of tinea versicolor is brilliantly demonstrated by this staining technique. However, the fungi are ordinarily so abundant in this disease that the simpler potassium hydroxide method is usually satisfactory.

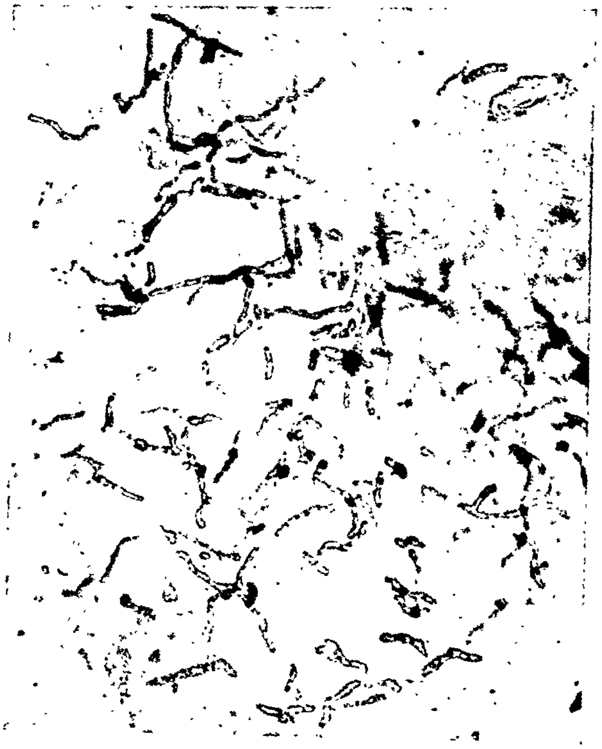

Fig. 2.—Stained mount from the same case. The hyphae are strikingly visible.

Another recently described method of staining fungi in skin scrapings with methylene blue has proved unsatisfactory in our hands.[7]

SUMMARY

1. A method is described of staining fungi in skin scrapings with basic fuchsin.

2. The method is superior to the potassium hydroxide technique, since a correct diagnosis can thus be made with much greater accuracy.

133 S. 36th St.

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[7] Gordon, M. A.: Rapid Permanent Staining and Mounting of Skin Scrapings and Hair, Arch. Dermat. & Syph. 63: 343 (March) 1951.

Atom Bomb Injuries.—The prognosis of radiation injury is summarized as follows: (*a*) If vomiting occurs on the day of the bombing and is followed by diarrhea, prostration, continued vomiting, anorexia and fever, survival is improbable, and death will occur in a matter of days. (*b*) If vomiting occurs on the day of the bombing and is followed by an asymptomatic period of one to three weeks before appearance of the typical symptoms of radiation injury (purpura, epilation, ulcerations of the mucous membranes, and gastro-intestinal disturbances), survival is possible. (*c*) If there is no vomiting on the day of the bombing, survival is probable unless there are complicating factors such as burns, thermal injuries, traumatic injuries, or concomitant epidemics. Epidemics in a leukopenic population may be catastrophic.—Comdr. Eugene P. Cronkite, M.C., U.S.N., Radiation Injuries Produced by Atomic Bombs, *Radiology*, May, 1951.

RHEUMATIC NODULES IN TUBERCULOSIS

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While studying the hearts of patients who died from tuberculosis, not infrequently we have found cellular infiltrations in the myocardium indistinguishable from Aschoff bodies. In the English literature such lesions apparently have not been described. They are not mentioned in Rich's comprehensive contribution [1] or in any of the texts of pathology. In the United States only Gouley, Bellet, and McMillan (1933)[2] have observed "submiliary foci of epithelioid cells around small blood vessels" and "large and small nodules of endothelial and round cells" which they interpreted as "tuberculous granular infiltration" in six cases of tuberculosis.

As the occurrence of Aschoff bodies in tuberculosis seems to be of greatest importance, not only for the understanding of this disease but especially for that of rheumatic heart disease, we felt it desirable to report our observations and briefly discuss their significance.

MATERIAL

This is a study of the hearts of 63 patients who at autopsy were found to have tuberculous lesions. In 62 of these patients the tuberculous involvement was in the lungs, and in all it was the primary cause of death. In one tuberculosis was found primarily in the adrenals, and that was the primary cause of death.

Types of Tuberculosis in Sixty-Three Cases of Tuberculous Lesions

Type	No. of Cases
Extensive ulcerocaseous pulmonary tuberculosis	28
Same with miliary spread	2
Fibrocaseous pulmonary tuberculosis	17
Same with miliary spread	2
Fibronodular pulmonary tuberculosis	3
Minor pulmonary lesions with acute miliary spread	10
Adrenal tuberculosis	1
	63

On an average, four portions of myocardium were taken, usually one from the septum and the rest from the left and right ventricles. From these between four and 16 microscopic slides were made in each case and stained in the usual routine hematoxylin and eosin method. In none of these hearts was there any sign, grossly, of active rheumatic heart disease. All patients with healed rheumatic lesions or a history of rheumatic fever were excluded from this series.

The accompanying table indicates the types of tuberculosis found in our cases.

GROSS FINDINGS

Most of the hearts were under the average normal weight. The myocardium was usually pale and in many cases exhibited the consistency and color which generally lead to the diagnosis of cloudy swelling. Grossly there was no indication of any specific myocardial change that might correspond to the lesions encountered microscopically. Three hearts showed typical tuberculous pericarditis, and a few showed old pericardial fibrosis or adhesions.

MICROSCOPIC FINDINGS

Miliary tubercles were not found in any of the sections examined. In spite of the fact that many of them had extensive miliary spread and most of them presented miliary tubercles, at least in the spleen and liver, no tubercles have been found in the myocardium. This does not refer to our experience in this series alone.

Nontuberculous granulomatous lesions were found in 13 cases. These granulomas could be classified in three groups:

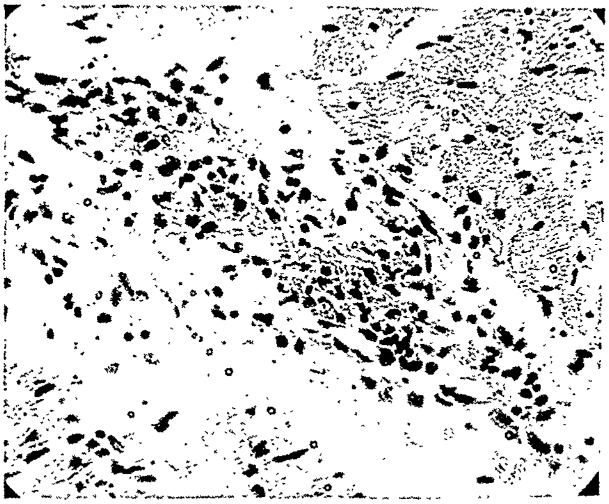

Fig. 1.—Typical young Aschoff bodies.

1. *Aschoff Bodies* (figs. 1 through 4).—Of these there were seven. All conformed to the criteria set for the identification of "rheumatic nodules." They were located in the interstitial spaces and were made up of collections of large spindle-shaped cells with a clear oval nucleus in which the chromatin tended to form a central irregular line oriented in the longitudinal sense (Anitschkow cells) and a sprinkling of "Aschoff cells" with mildly basophilic cytoplasm. The American Heart Association sets down the following pattern for Aschoff bodies [3]: A. Early Aschoff bodies (fig. 1)—Aschoff cells are conspicuous large cells with granular basophilic cytoplasm, prominent nucleus, vesicular nucleoplasm, and dense nuclear membrane; occasional polymorphonuclear leukocytes may be present, and surrounding collagen fibers are swollen and eosinophilic. B. Later Aschoff bodies (fig. 2 through 4)— Cells may become larger and multinucleated, and small lymphocytes and fibroblasts may appear.

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[1] Rich, A.: Bull. Johns Hopkins Hosp. **75**: 115, 1944.

[2] Gouley, B. A.; Bellet, S., and McMillan, T. M.: Arch. Int. Med. **51**: 244 (Feb.) 1933.

[3] Criteria Committee of New York Heart Association: Nomenclature and Criteria for Diagnosis of Diseases of the Heart, New York, New York Tuberculosis and Health Association, 1940.

2. *Aschoff Bodylike Granulomas.*—Of these we had one. They represent perivascular infiltrations which are very suggestive of rheumatic nodules but are not entirely identical with the prescribed picture.

3. *Nondescript Granulomas.*—There were five of these. In this group were included aggregates of cells which constituted definite and striking interstitial lesions but very easily could be segregated from the group of typical Aschoff bodies. They were made up of Anitschkow cells together with plasma cells or of large cells with prominent nuclei and reticular chromatin without Anitschkow cells. Although they were not typical Aschoff bodies, they certainly might be termed such; these, too, might be called rheumatic nodules.

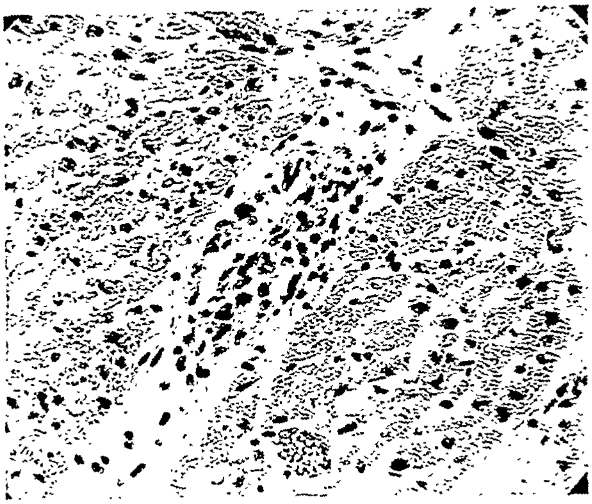

Fig. 2.—Typical adult Aschoff bodies.

4. Finally, diffuse cellular infiltrations, which were not granulomas, were found in four cases. Curiously, the four were quite distinctly different. One showed an intermingling of polymorphonuclear leukocytes and monocytes (fig. 8). In another case there was a fresh infiltration with polymorphonuclear leukocytes (fig. 7). Monocytes and lymphocytes were found in a third case, and the other showed a pure lymphocytic infiltration. These were taken to be a nonspecific change, although the question remains open as to whether they were early stages of a tuberculous lesion or whether they might have been associated in some way with the subsequent formation of granulomas. They were not coincident with the granulomas.

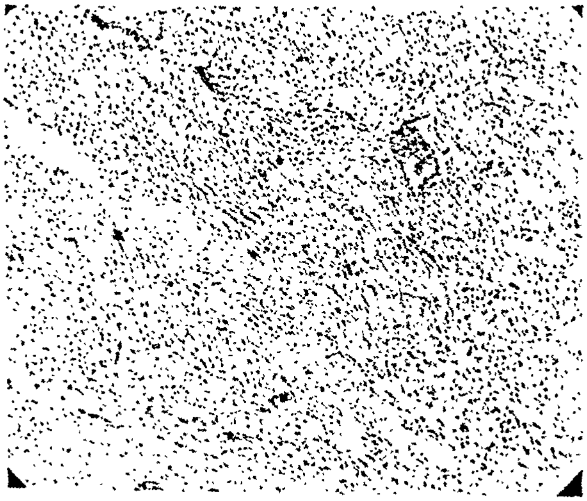

Fig. 3.—Typical adult Aschoff bodies in upper center portion.

COMMENT

In reviewing the literature we found that Aschoff bodies and similar granulomas have been described fairly often not only in tuberculosis but also in other infectious diseases.[4] The interpretations of these offered by the different authors have been different. To date the issue seems far from settled. The specificity of the Aschoff bodies as a manifestation of rheumatic fever in the strictest sense is defended by many[5]; the nonspecificity of this lesion is maintained by others.[6] Finally, some have gone further and consider the Aschoff body, because it may be found in tuberculosis, as the connecting link between the two diseases.[4b]

The first point that must be discussed is whether the lesions we have found are identical with Aschoff's rheumatic nodule. Staunch defenders of the specificity theory have always maintained that similar lesions found in nonrheumatic patients did not look to them like Aschoff bodies. Soon after the latter were described, Lubarsch[4a] reported finding similar or identical structures in patients with scarlet fever. Fahr[5a] came to the defense of the specificity theory by stating that he could see definite differences between the true lesions encountered in rheumatic patients and the spurious ones occurring in scarlet fever. More recently, Stoeber[4e] repeated the observation, maintaining the distinction, and he even went over 18 cases of tuberculosis to answer the claims of those who had found granulomatous lesions in the latter disease. He found there, as he states, "no Aschoff bodies."

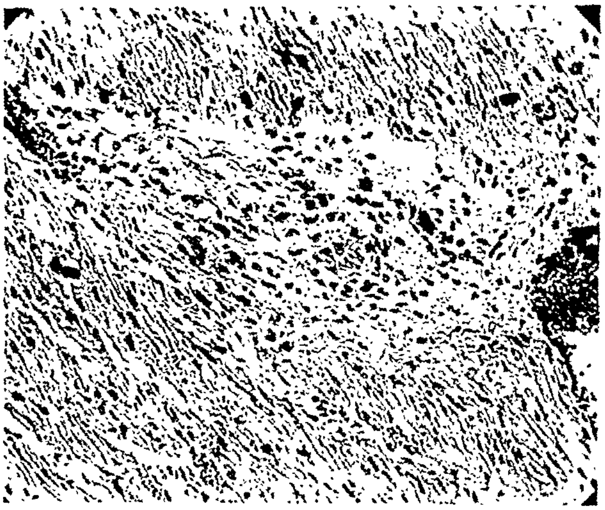

Fig. 4.—Same section as figure 3 under high power.

On the other hand, Masugi and associates[4b] on examining 215 hearts of tuberculous patients found 35 (16.3%) with interstitial cellular collections whose appearance showed all the transitions from typical Aschoff bodies to structures very similar to miliary tubercles. Ozawa [4d] examined 187 hearts of patients dying of pulmonary tuberculosis. In 41 (21.9%) of these he found "granulomata." Yamada,[4c] in 350 hearts of tuberculous patients, found 39 (11.1%) with interstitial lesions, 2 of which were identical with Aschoff bodies, 14 of which were very similar, and 23 of which showed a tendency toward epithelioid tubercle formation. The same author studied 120 cases of various other diseases, including scarlet fever, "croupous pneumonia," glomerulonephritis, and others; 13 of these showed myocardial lesions similar to Aschoff bodies. Patients with carcinoma were free of such lesions.

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[4] (*a*) Lubarsch: cited by Brockhausen, K.: Virchows Arch. f. Path. Anat. **274**: 302, 1930. (*b*) Masugi, M.; Murasawa, S.; Yä-Shu: ibid. **299**: 426, 1937. (*c*) Yamada, S.: Tr. Soc. Path. Japan **30**: 450, 1940. (*d*) Ozawa, M.: Tr. ibid. **28**: 230, 1938. (*e*) Stoeber, E.: Arch. f. Kinderh. **105**: 193, 1935.

[5] (*a*) Fahr, T., cited by Masugi, Murasawa and Yä-Shu.[4b] (*b*) Stoeber.[4e]

[6] Klinge, F.: Ergeb. d. allg. Path. u. path. Anat. **27**: 1, 1933.

Brockhausen [7] reported one case in which typical tubercles were found side by side with not only granulomas but also lesions resembling periarteritis nodosa. He described the granulomas as differing from Aschoff bodies in their loose texture and their profuse lymphocytic infiltration.

In our appraisal of the question of the histological specificity of the rheumatic nodule it may be well to bring up the matter of whether every lesion found in the myocardium of unchallengeable cases of rheumatic fever conforms exactly to the criteria of morphology of an ideal Aschoff body. Perhaps the percentage of "perfect" Aschoff bodies in rheumatic hearts with myocardial changes is not much different from that found in nonrheumatic hearts showing granulomatous myocardial lesions, as, for example, in our group. It seems to us very likely that in examining sections from a heart with obvious gross rheumatic lesions, the observer might not be too exacting as to the standards used in labeling any granulomatous lesion found an Aschoff body.

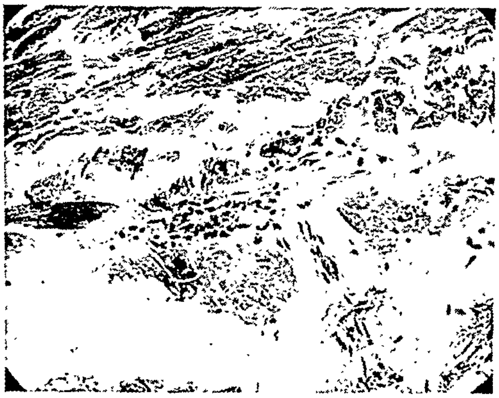

Fig. 5.—Typical small Aschoff bodies.

Since a good many of the lesions found in our cases conformed in every detail to the strictest criteria, we feel that it is permissible to say that typical Aschoff bodies occur in the hearts of some tuberculous patients showing no indication of rheumatic fever, active or latent.

Let us consider now the significance of our observations. As expressed by Masugi [4b] they can be explained in one of three ways: 1. A rheumatic disease of the myocardium existed in these patients coincidentally with tuberculosis and without any other sign of rheumatic fever. 2. Rheumatic fever and tuberculosis are one and the same disease. 3. Aschoff bodies are the expression of a nonspecific tissue response to varied stimuli, probably of an allergic nature.

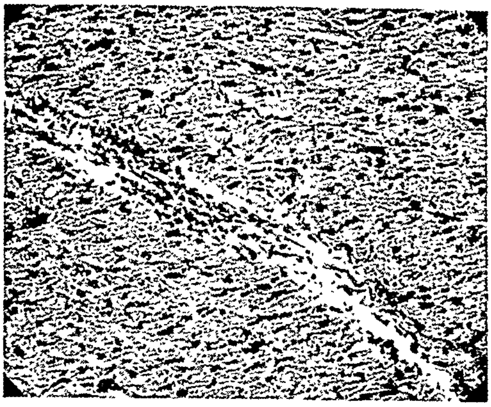

Fig. 6.—Typical small Aschoff bodies.

The first possibility remains theoretically tenable but seems highly improbable because the percentage of positive findings is far higher than would be warranted by the statistical probability of coincidence of the two diseases.

The second view has been held by various authors. Tuberculous rheumatism, as such, was first postulated by Poncet in 1902. Loewenstein's positive blood cultures for tubercle bacilli in cases of chronic and of acute polyarthritis strengthen this view. These observations were never satisfactorily confirmed, and the theory fell into disrepute. Recently, Masugi,[4b] on the histopathological findings, again postulated the relationship between the two diseases. He was impressed particularly by the gradation of myocardial lesions from the typical tubercle to the Aschoff body. With his co-workers he studied 24 rheumatic fever patients, all of them with endocarditis, and found that 11 of them had signs of tuberculosis, five of them with active lesions. Finally, Lewkowicz [8] has described an organism which he calls "tuberculo-coccoid" and designated it as the agent of a group of diseases

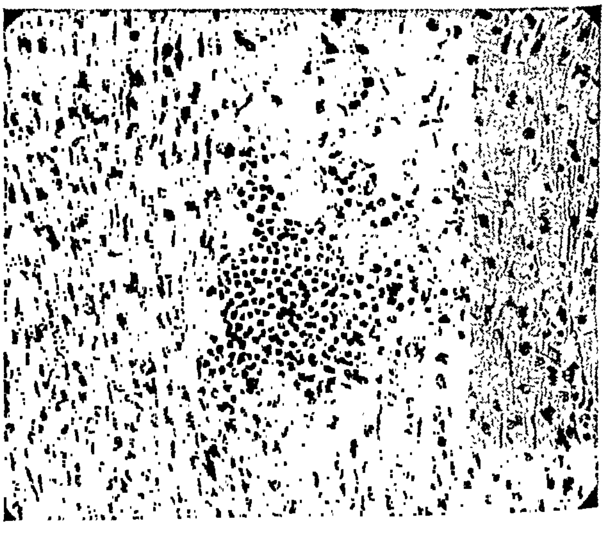

Fig. 7.—Interstitial myocarditis; fresh infiltration with polymorphonuclear leukocytes.

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7. Brockhausen, K.: Virchows Arch. f. Path. Anat. 274: 302, 1930.
8. Lewkowicz, K: Beitr. z. klin. Tuberk. 92: 680, 1939.

which he has classified as "inflammatory tuberculosis." Among these he would include rheumatic fever. This acid-fast "coccoid" is almost always intracellular, may be small enough to be filterable, and, according to that author, shows transitional stages toward the bacillary form. The same writer refers to the obtaining by Coronini of positive tubercle bacillus cultures from hearts of rheumatic patients.

The search for an etiological agent of rheumatic fever has long been directed toward the acid-fast organisms. It is well known that no convincing evidence has ever been produced in this sense. While the chapter is not closed, at this point it seems highly problematical that rheumatic fever may be a manifestation of tuberculosis.

It remains as the most suggestive hypothesis that the Aschoff body and the morphologically related granulomas may be an allergic response to varied allergens, among which the tubercle bacillus is a prominent one.

There has been experimental evidence to show that interstitial granulomas may be produced in the heart by different antigens. This was first brought into prominence by the work of Klinge,[6] using protein sensitization and reinjection. He observed all types of granulomas up to typical Aschoff bodies. His conclusion was that these lesions were not specific. Later, Rich and his group[1] produced similar lesions almost at will in their experiments dealing with sensitization to foreign proteins. Yamada[4c] sensitized rabbits to the tubercle bacillus and, after a second inoculation, was able to demonstrate in the heart and muscles micronodular lesions closely resembling the Aschoff body. Saphir[9] speaks of granulomatous myocarditis due to hypersensitivity to chemicals (arsenic and others).

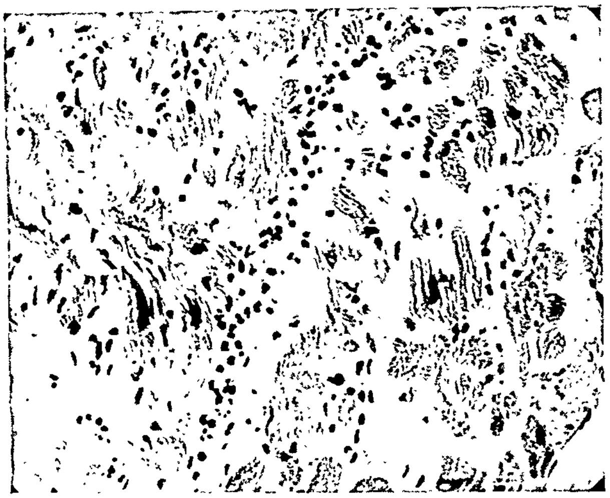

Fig. 8.—Interstitial myocarditis; intermingled polymorphonuclear leukocytes and monocytes.

Allergy admittedly plays an important role in the course of pulmonary tuberculosis. The relationship between the allergic status of the tuberculous patient and the development of interstitial rheumatoid granulomas is not quite clear. In Ozawa's series there was a marked predominance of exudative tuberculosis, widely regarded as a manifestation of increased allergic response. Masugi found no significant distribution but, believing that the granulomas were a form of tuberculosis, came to the conclusion that they represent a type of reaction in which the tissue overcomes the invading organism to the point of destroying it entirely. That explained, in his mind, why bacilli were never found in these lesions.

In our material typical Aschoff bodies occurred largely in cases of exudative tuberculosis. We, therefore, feel that it is logical to associate these lesions with a reaction of the type observed by Klinge and Rich due to hypersensitivity to various allergens, in this instance the tubercle bacillus.

SUMMARY AND CONCLUSIONS

The hearts of 63 tuberculous patients were examined. Thirteen revealed granulomatous lesions in the myocardium. Seven of these lesions were identical with Aschoff bodies. There were no gross anatomical signs of latent, healed, or active rheumatic heart disease in any of these patients. In the light of present knowledge, our observation, or interpretation, of these lesions supports the conclusions of those authors who believe that rheumatic nodules are allergic phenomena due to various allergens rather than the specific response to a specific agent.

19th and Lombard St. (Dr. A. Valdés-Dapena).

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[9] Saphir, O.: Arch. Path. 32: 1000 (Dec.) 1941.

Leukemia.—In this dread disease there are numerous manifestations which are recorded as isolated facts in textbooks of medicine without any emphasis on the conclusions which can be drawn from them and without any attempt to bring them into a perspective where they can be used to discuss the nature of the disease. The spectacular and absorbingly interesting hematological changes have received the most minute attention, and this alone has tended to overshadow the morbid anatomy and basic pathology and also to divert attention from certain clinical facts which may provide the clue to the elucidation of the cause and the devising of appropriate treatment. . . . We are thoroughly familiar with two types of the disease which we designate as leukemic or aleukemic, according to the state of the peripheral blood, but these do not differ greatly in clinical features save that in aleukemic cases the lymph nodes, the spleen, and the liver may not be so grossly enlarged at the outset. This fact, that the disease may be leukemic or aleukemic, is accepted as a commonplace, a mere variation in manifestations. It has not given rise to argument and serious discussion. Yet the fact that two types exist suggests the derangement of two different processes which, on rational grounds, should be physiologically interlocked. I refer first to the process of maturation and, secondly, to the process of release into the circulation. . . . In frank leukemia, there appears to be inhibition or retardation of maturation in whole or in part, combined with lack of control over release, since vast numbers of cells, including primitive ones, flood the circulation. In the aleukemic disease lack of maturation is a prominent feature, but the release mechanism is largely intact in that the numerous primitive cells in the marrow may not reach the circulation except in small numbers.

These facts make it abundantly clear that we know little or nothing of the physiology of leucopoiesis, and I am convinced that we shall not understand leukemia until some of these basic physiological facts have been determined. If half the time and energy which have been devoted to devising and exploiting empirical remedies for the symptomatic treatment of the disease, reducing the leucocyte count, had been expended on basic physiology and pathology, we might well be much nearer to rational treatment.—Sir Lionel Whitby, Whither Clinical Pathology? Trends and Opportunities, *Journal of Clinical Pathology*, May, 1951.

ACUTE GLOMERULONEPHRITIS FOLLOWING ADMINISTRATION OF RHUS TOXIN

REPORT OF A FATAL AND A NEAR FATAL CASE

Bertram Shaffer, M.D., Carrol F. Burgoon, M.D., Philadelphia
and
James H. Gosman, M.D., Indianapolis

Administration of extracts of poison ivy for active treatment of the acute dermatitis caused by this plant has been widely practiced. It is the purpose of this report to call attention to a variety of reactions, particularly serious kidney damage, which may occur following this treatment.

The plants which commonly produce this type of contact dermatitis belong to the family Anacardiaceae, and are Rhus Toxicodendron (poison ivy), Rhus diversiloba (poison oak), and Rhus Vernix (poison sumac).

Local and general reactions have been reported in patients given prophylactic or active treatment, orally or by injection, with extracts of these substances.[1] Intramuscular injections for prophylaxis against future attacks may cause local reactions at the site of injection, as well as constitutional and cutaneous reactions.[2] Oral administration, in an attempt at hyposensitization, produces various types of localized and generalized eruptions,[3] stupor, convulsions, and hyperpyrexia.[4] In patients with acute dermatitis to whom the extract was given intramuscularly as treatment, systemic reactions,[5] marked exacerbation and prolongation of the existing dermatitis [6] and hemorrhagic skin reactions [7] have been noted. Rytand [8] described seven patients with severe kidney damage following poison oak dermatitis, three of whom died.

We have recently observed a fatal reaction and a near-fatal reaction was brought to the attention of one of us (C. F. B.), both reactions occurring in patients in whom intramuscular injections of Rhus toxin were administered for the active treatment of the dermatitis. In these cases the dermatitis was exacerbated and, following a short latent period, the clinical symptoms and signs of acute glomerulonephritis developed. The use of this material for active treatment is widespread, and, for this reason, we feel these severe complications are worth reporting.

The Council on Pharmacy and Chemistry of the American Medical Association has warned of the potential dangers of these preparations.[9] It has pointed out that, in spite of numerous reports since 1925, the efficacy of these extracts administered parenterally for prophylaxis of Rhus dermatitis has never been established, and that while the oral desensitization method using very large doses of these substances is often effective, this method is cumbersome, time consuming, unpredictable, and fraught with discomfort and danger to the patient, and the extract should be administered only by an expert. The Council, furthermore, stated that the reports dealing with the treatment of acute dermatitis with these extracts are few in number and completely unconvincing as to their beneficial effects. Since from a theoretical point of view their use is unjustifiable, and since exacerbations of dermatitis have been known to result from this form of treatment, the report of the Council denounced the use of these preparations in the phylactic treatment of acute dermatitis. More recently Hoagland [10] in an excellently controlled study has thrown further doubt on the benefit to be derived from prophylactic injection of Rhus extracts.

REPORT OF CASES

Case 1.—J. M. R., a white man aged 61, was admitted to Skin and Cancer Hospital on Sept. 25, 1947. Two weeks preceding admission, pruritus, edema, and erythema of the face, hands, and arms developed a few hours after he weeded his garden. A series of four daily intramuscular Rhus toxin antigen injections was started the following day. On September 17, following the fourth injection, his dermatitis became markedly worse. Previous medical history revealed nothing of note except a severe case of Rhus dermatitis ten years previously.

Physical examination revealed a generalized scaling erythroderma with large purulent bullae on the feet and hands, a widespread folliculopustular eruption on the trunk, and pronounced edema of the entire face, hands, arms, and legs up to the knees. Temperature on admission was 100.2 F.; pulse, 80; respirations, 30, and the blood pressure was 150/90. The remainder of the physical examination was essentially normal. Laboratory studies of the blood on admission showed a hemoglobin value of 83% and 9,000 leukocytes with normal differential. Urinalysis revealed a specific gravity of 1.025, a trace of albumin, occasional white blood cells and a few hyaline casts. The bacteriologic culture of bullous fluid was negative for Staphylococcus albu and Staphylococcus aureus by coagulase test.

From the Skin and Cancer Hospital of Philadelphia, and the Department of Dermatology and Syphilology, Medical School of the University of Pennsylvania, Dr. Donald M. Pillsbury, Director.

1. (*a*) Alderson, H. E., and Pruett, H. J.: Poison Oak Dermatitis (A Specific Treatment), California State J. Med. **19**: 188, 1921. (*b*) Howell, J. B.: Evolution of Intramuscular Injection of Specific Extracts in Treatment of Acute Poison Ivy Dermatitis, Ann. Allergy **5**: 219, 1947. (*c*) Shelmire, B.: Hyposensitization to Poison Ivy, Arch. Dermat. & Syph. **44**: 983 (Dec.) 1941, (*d*) Gold, H., and Masucci, P.: Oral Prophylaxis Against Poison Ivy, J. Allergy **13**: 606, 1942. (*e*) Goldman, L.: The Reactions Following the Therapeutic Use of Poison Ivy Antigen for Poison Ivy Dermatitis, J. Med. **20**: 294, 1939. (*f*) Zisserman, L., and Birch, L.: The Prophylaxis and Treatment of Poison Ivy Dermatitis with an Extract of Rhus Toxicodendron, J. Allergy **10**: 596, 1939. (*g*) Shelmire, B.: Cutaneous and Systemic Reactions Observed During Oral Poison Ivy Therapy, ibid. **12**: 252, 1941. (*h*) Lowenberg, H.: Poisoning Due to Tincture of Rhus Toxicodendron, J. A. M. A. **135**: 91 (Sept. 13) 1947. (*i*) Caulfield, A. H. W.: Prevention of Poison Ivy Dermatitis by Intramuscular Injections of "Rholigen" (Rhus Toxoleo-Antigen), Canad. M. A. J. **37**: 18, 1937. (*j*) Sompayrac, L. M.: Negative Results of Rhus Antigen in Treatment of Experimental Ivy Poisoning, Am. J. M. Sc. **195**: 361, 1938. (*k*) Corson, E. F.: The Value of the Toxin of Rhus Toxicodendron and Rhus Venenata, Correspondence, J. A. M. A. **81**: 59 (July 7) 1923. (*l*) Templeton, H. J.: Untoward Reactions Following Toxin Treatment for Dermatitis Venenata, Arch. Dermat. & Syph. **20**: 83 (July) 1929.

2. Zisserman,[1f] Caulfield,[1i] and Sompayrac.[1j]

3. Shelmire,[1c] Gold,[1d] and Shelmire.[1g]

4. Lowenberg.[1h]

5. Anderson and Pruett.[1a]

6. Howell,[1b] Goldman,[1e] and Corson.[1k]

7. Goldman.[1e]

8. Rytand, D. A.: Fatal Anemia, the Nephritic Syndrome and Glomerular Nephritis as Sequels of the Dermatitis of Poison Oak, Am. J. Med. **5**: 548, 1948.

9. Stevens, F. A.: Status of Poison Ivy Extracts, report of the Council on Pharmacy and Chemistry, J. A. M. A. **127**: 912 (April 7) 1945.

10. Hoagland, R. J.: Prophylaxis of Rhus Toxicodendron *Dermatitis*, New England J. Med. **242**: 130, 1950.

Treatment consisted of debridement of the hands and feet, Burow's solution compresses, forced fluids, tripelennamine (pyribenzamine®) hydrochloride, and boric acid irrigation to the eyes.

By October 4, the condition of the skin had improved, and the pruritus, scaling, and edema of the face and hands had diminished. However, there was pronounced edema of the lower extremities up to the knees. On October 10, the patient complained of shortness of breath, urinary frequency, nausea, headache, and mild diarrhea. Physical examination revealed edema involving the legs, hips, and abdominal wall, and moist rales at the bases of both lungs. The blood pressure rose to 186/110. Laboratory findings were blood urea nitrogen, 43 mg. per 100 cc.; urinary output, 3,600 cc.; urine, a specific gravity of 1.030, a heavy cloud of albumin, occasional red and white blood cells, and a moderate number of fine and coarsely granular hyaline casts. The blood cell count showed only moderate leukocytosis. On the following day, the pruritus had increased, and erythema and urticaria appeared over the face and shoulders. In four days the urinary output fell to 700 cc. A phenolsulfonphthalein test showed 25% excretion in the first hour and 18% in the second. A Mosenthal test demonstrated limited urine concentration of from 1.015 to 1.017 in specific gravity. Serum albumin was 3.9 mg. per 100 cc. and globulin 2.3 mg. per 100 cc. The edema increased, blood pressure rose to 221/118, and the patient developed fleeting periods of mental confusion. The blood count showed a 5% eosinophilia. The patient became anuric, blood urea nitrogen rose to 105 mg. per 100 cc., and blood pressure reached a point beyond manometer readings. He died on October 21, twenty-six days after admission. A blood count done the day before death showed 9% eosinophilia.

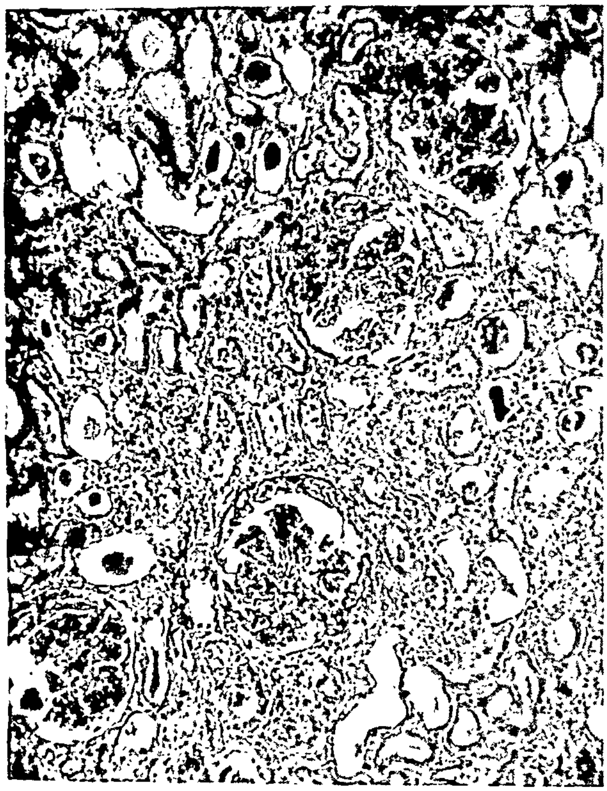

Fig. 1.—Microscopic section of kidney in case 1 showing the features of acute glomerulonephritis. These included swelling, bloodlessness, and coarsening of the glomerular tufts. Increase in nuclei with proliferation of the glomerular and capsular epithelium and adhesions are evident. Many tubules are distended, elongated, and contain casts. The lining cells show flattening and degeneration. The interstitial tissue is the site of edema and cellular infiltration.

Autopsy was limited to the kidneys. On opening the abdomen there was no evidence of peritonitis, and all organs appeared normal. Grossly, the kidneys cut with increased resistance; the capsule stripped easily leaving a relatively smooth, slightly granular surface. Petechial hemorrhages and small areas of necrosis were seen.

On microscopic examination (made by Dr. Warren F. Sheldon) the glomeruli showed the changes typical of acute glomerulonephritis. They were diffusely involved by an inflammatory process characterized by moderate swelling, nearly complete bloodlessness, and subdivision of the glomerular mass into several coarse club-like parts. The number of nuclei was greatly increased. This increase was due to proliferation of both capsular and endothelial lining cells and to infiltration by moderate numbers of leukocytes. Of the few capillaries that were open, many appeared to be plugged by agglutinated masses of red blood cells or similar-staining hyaline thrombi. The glomerular capsular epithelial lining showed active proliferation with many adhesions to the tuft. Well-formed "crescents" were common.

The tubules showed slight focal atrophy. Many were distended by casts of brightly eosinophilic hyaline material (probably protein). These casts extended the whole length of the nephron from the glomerulus to the tip of the pyramid but were larger in the loop of Henle and below. The tubular epithelium was often flattened. The proximal tubular epithelium stained irregularly and contained vacuoles. Many cells contained masses of coarse intracytoplasmic, brightly eosinophilic, hyaline droplets (probably protein). The interstitial tissue was moderately increased in amount, due largely to edema and mild leukocytic infiltration, mostly lymphocytes, plasma cells, monocytes, with variable numbers of polymorphonuclear leukocytes. The small arteries occasionally seemed swollen and contained leukocytes in and near the wall.

Case 2.—A. M., a white woman aged 42, was admitted to the Emergency Hospital in Doylestown, Pa., on May 16, 1947. Two weeks prior to admission she had contact with poison ivy, and within approximately 24 hr. typical acute contact dermatitis involving the hands, face, and forearms had developed. The patient received Rhus tox antigen intramuscularly at daily intervals for four days. After the first two injections the dermatitis became worse and generalized, but following the fourth injection the dermatitis appeared to be improving. Three days after the last injection the patient had a chill, temperature became elevated, and headache, anorexia, and nausea developed.

The patient was admitted to the hospital with temperature 100 F., pulse 110, respirations 26, and blood pressure 116/80. During the subsequent period of hospitalization, anorexia increased, and nausea and vomiting, restlessness, and edema of the face developed, blood pressure increased (180/100), oliguria developed (300 cc. in 72 hours after admission), blood urea nitrogen rose (56 to 65 mg. per 100 cc.) and red blood cells and albumin appeared in catheterized specimens of urine. On the 10th day of hospitalization with increasing urinary excretion, there was rapid clinical improvement. The patient was discharged on the 23rd day of hospitalization. The blood pressure and urine returned to normal within a period of six months and have remained normal to the present time.

COMMENT

The evidence that these patients had kidney disease is conclusive. It seems probable that the kidney disease was due to sensitivity to Rhus toxin.

The pronounced sensitivity of the patients to Rhus toxin was indicated by the history of a previous severe dermatitis venenata in case 1 and the exacerbation of the present dermatitis following injections of the Rhus extract in both cases. That the kidney complication was a sensitization phenomenon is suggested by the latent

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11. Rytand, D. A.; Burnha, D. W., and Cox, A. M.: Periarteritis Nodosa Following the Dermatitis of Poison Oak and of Primrose, Stanford M. Bull. 6:319, 1948.

12. Hill, C. A.; Mattacotti, V., and Graham, W. D.: The Toxic Principle of Poison Ivy, J. Am. Chem. Soc. 54:2756, 1932.

13. Mason, H., and Schwartz, L.: The Toxic Principles of Poison Ivy, J. Am. Chem. Soc. 64:3058, 1942.

14. Landsteiner, K., and Jacobs, J.: Studies on the Sensitization of Animals with Simple Chemical Compounds. J. Exper. Med. 64:625, 1936.

period between the last injection of Rhus toxin and the first sign of kidney disease. In case 1 there was an associated increasing eosinophilia. The renal disease in both cases was an acute, rapidly advancing process rather than a chronic degenerative one, as evidenced by the fulminating clinical signs with concomitant laboratory changes.

Rytand [8] reported the appearance of renal disturbances in seven patients three days to two months after the onset of poison oak contact dermatitis. Three of these patients died, and of these, two had been given Rhus toxin for the active treatment of their dermatitis. Rytand and others [11] have also reported two cases of periarteritis nodosa with a renal involvement, following contact type plant dermatitis.

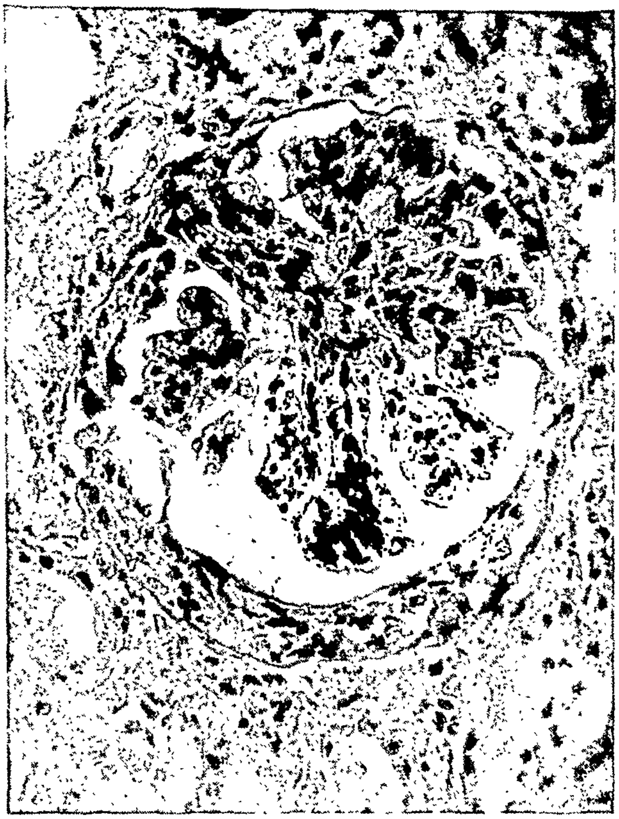

Fig. 2.—Enlargement of glomerular tuft in Figure 1, revealing the proliferation and inflammatory features in both the glomerular and capsular epithelium.

The chemical nature of the Rhus toxin has been extensively studied for the past 50 years.[12] The active principle is apparently a toxic oil with three active components and several innocuous concomitants as demonstrated by fractional distillation.[13] Hill and others [12] reported that at least one of the toxic principles was a catechol compound (urushiol).

Such relatively simple compounds may induce both epidermal sensitization and anaphylactic shock by acting as hapten allergens.[14] This process probably occurs through conjugation with the host's own protein.[15] It is thought that the active fraction of Rhus is a polyhydric compound which is oxidized to a quinone configuration before reacting with native protein to form a fully antigenic compound.[15a,b] A complete antigen of this type may produce sensitization of the entire organism as well as local epidermal phenomenon.[16] Proof of systemic sensitization with Rhus is demonstrated by recent studies in experimental animals in which sensitivity to poison ivy was passively transferred with serum as well as with cellular extracts of spleen.[16a]

Rich [17] has demonstrated that simple chemical compounds such as sulfonamides may induce an allergic reaction in the kidney manifested by glomerulonephritis or periarteritis nodosa. It is suggested that Rhus toxin may act as a hapten allergen in the same manner and also produce glomerulonephritis.

SUMMARY AND CONCLUSIONS

Two cases of acute glomerulonephritis occurring one week and four weeks after injections of Rhus toxin for the treatment of patients with dermatitis venenata due to poison ivy are reported.

In the fatal case, the associated eosinophilia, urticaria, and histological changes in the kidney indicate that the patient's death was a result of an allergic phenomenon.

Rhus toxin is a potentially dangerous hapten-type allergen which may induce systemic sensitization.

The administration of Rhus extracts is of no demonstrated value in the active treatment of plant dermatitis. Because of their great potential danger, it is felt that Rhus extracts should not be used in these cases.

1825 Pine St.

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15. (*a*) Keil, H.; Wasserman, D., and Dawson, C. R.: *The Relation of Chemical Structures in Catechal Compounds and Derivatives to Poison Ivy Hypersensitiveness in Man as Shown by the Patch Test,* J. Exper. Med. **80**: 275, 1944. (*b*) Gell, P. G. H.; Harrington, C. R., and Rivers, R. P.: The Antigenic Function of Simple Chemical Compounds: Production of Precipitins in Rabbits, Brit. J. Exper. Path. **27**: 267, 1946. (*c*) Landsteiner, K.: Specificity of Serologic Reactions, ed. 2, Cambridge, Mass., Harvard University Press, 1945.

16. (*a*) Chase, M. V.: The Cellular Transfer of Cutaneous Hypersensitivity, J. Bact. **51**: 643, 1946. (*b*) Crepea, S. B., and Cooke, R. A.: Study of Mechanism of Dermatitis Venenata in Guinea Pig with Demonstrations of Skin Sensitizing Antibody by Transfer, J. Allergy **19**: 353, 1948. (*c*) Landsteiner, K., and Chase, M. W.: Experiment of Transfer of Cutaneous Sensitivity to Simple Compounds, Proc. Soc. Exper. Biol. & Med. **49**: 688, 1942.

17. Rich, A. R.: *Hypersensitivity in Disease with Especial Reference to Periarteritis Nodosa, Rheumatic Fever, Disseminated Lupus Erythematosus and Rheumatoid Arthritis,* Harvey Lect. (1946-1947) **42**: 106-147, 1947.

Sphincter-Saving Resections of the Rectum.—Undoubtedly the most exciting development in the surgery of rectal cancer in recent years has been the attempt to revive sphincter-saving excisions in the radical treatment of this disease. Of course, it has always been the ambition of right-thinking surgeons to be able to excise malignant growths of the rectum without having to sacrifice the wonderful anal sphincter apparatus, but earlier experiences at the turn of the century with operations of this type had not been very happy and after a brief period of popularity they fell out of favor in this country and America, though still employed in Germany and Austria.

The present re-awakening of interest has been due to the important researches on the spread of rectal cancer by Cuthbert Dukes (1940) and Heinrich Westhues (1934). They have provided solid pathological grounds for believing that sphincter preservation is compatible with the requirements of radical surgery for most growths in the upper half of the rectum or rectosigmoid. Whether this is in fact so can only be decided by an extended trial in actual practice and that is now being undertaken in many centers in the United States and in Britain. —J. C. Goligher, Ch. M. Edin., F.R.C.S., Hunterian Lecture delivered at the Royal College of Surgeons of England, March 13, 1951, *Annals of the Royal College of Surgeons of England,* June, 1951.

CHRONIC VITAMIN A POISONING

REPORT OF A CASE

George Bair, M.D., New York

Hypervitaminosis A is a syndrome first described by Josephs in 1944.[1] Subsequently, there have been 13 additional cases reported.[2] Observers have noted the following characteristic manifestations of the entity: external cortical thickenings of the affected bones, pain and swelling over the long bones, irritability and fretfulness, and increased vitamin A concentration in the blood.

REPORT OF CASE

B. Z., a 28-month-old white child, was first seen by me on April 15, 1950, after he had been ill at home for two and one-half weeks. His main complaints were painful swellings of the left foot, right forearm, and temporal regions. He also complained of severe itching of the back and arms. At the onset, although limping, the child was able to get around, but within a few days the pain became so severe that he refused even to attempt to walk. Penicillin and aureomycin were administered during the first two days of the illness, but were discontinued because he became progressively worse.

Fig. 1.—Left foot, showing swelling in region of fifth metatarsal.

Past History.—The child had been a full-term, normal-delivery infant weighing 6 lb. 7 oz. (2.9 kg.) at birth. Five days post partum his mother died of virus pneumonia, so that he was brought up by grandparents. His feeding history was unusual in several respects. Since he rejected solids for the most part, his food was taken strained or mashed. He craved butter and ate large quantities of it. In addition, he showed a preference for milk, cheese, eggs, liver, carrots, tomatoes, and sweet potatoes. His appetite had been good until the onset of symptoms, after which he rejected all food. The vitamin intake was supposed to be 20 drops of percomorph liver oil daily. However, when the diagnosis became evident, requestioning disclosed that because of an error a considerably larger amount of oil had been given.

Seven weeks before the onset of symptoms, the child complained of itching in the back of his neck. During the following weeks the pruritus became more intense and spread down the back and arms. This was so troublesome that a doctor who was consulted thought it was an allergic condition.

Physical Examination.—Examination revealed a well-developed, well-nourished boy who appeared sick and in pain. The child seemed to have a stiff neck when sitting up. He was fretful and irritable. His face was puffy; the lips, in contrast, were dry and fissured. Thin serous fluid ran from the nose. Bilateral temporal swellings, larger on the left, were visible and palpable. A fusiform swelling covered the fifth left metatarsal. The dorsa of both feet were edematous, and the right forearm was swollen.

All swellings were hard and tender. Only one area, the outer aspect of the fifth left metatarsal, was hot and bluish in color. The entire body, even those parts which were not swollen, was tender to the touch. The tonsils were enlarged.

There was no palpable enlargement of spleen or liver. No abnormal masses were felt in the abdomen.

At no time during the illness did the temperature rise over 100 F.

Hemoglobin value was 79%; the red blood cell count was 4,900,000; the white blood cell count was 10,200; platelets 240,000; neutrophils: nonsegmented 6%, segmented 39%; eosinophils 2%, lymphocytes 45%, monocytes 7%, plasma cells 1%; hematocrit reading was 35.3; icterus index, two units; sedimentation rate (Westergren), 56 mm. in one hour (normal is up to 15 mm. in one hour). The findings in the urine were normal.

Blood vitamin A level on April 18, 1950, was 1040 I. U. (normal 50-150 I. U.).

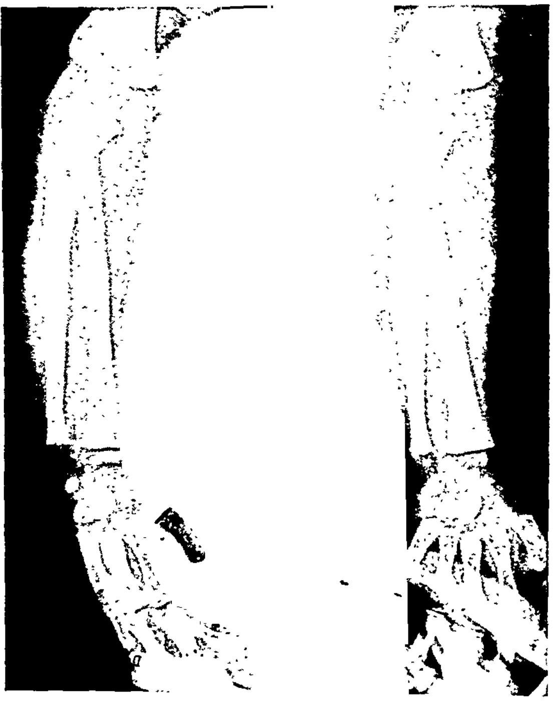

Fig. 2.—Right ulna, showing cortical thickening in the middle third of the shaft.

X-ray examination completed on April 15, 1950, revealed the following abnormalities:

Left Radius: Normal except for slight swelling of the soft tissues adjacent to the distal lateral aspect of the shaft.

Right Ulna: Smooth, homogenous, moderately dense external cortical thickening in the middle third of the shaft. The margins of this hyperostosis were smooth and merged imperceptibly with the marginal cortex. There was no evidence of destruction. Distinct soft tissue swelling was seen contiguous to the cortical thickening.

Dr. John Caffey assisted in the preparation of this paper.

Department of Pediatrics, New York Medical College, Flower and Fifth Avenue Hospitals.

[1] Josephs, H. W.: Hypervitaminosis A and Carotinemia, Am. J. Dis. Child. 67:33 (Jan.) 1944.

[2] Toomey, J. A., and Morissette, R. A.: Hypervitaminosis A, Am. J. Dis. Child. 73:473 (April) 1947. Rothman, P. E., and Leon, E. E.: Hypervitaminosis A, Radiology 51:368, 1948. Dickey, L. B., and Bradley, E. J.: Hypervitaminosis A: Case Report, Stanford M. Bull. 6:345, 1948. Fried, C. T., and Grand, M. J. H.: Hypervitaminosis A, Am. J. Dis. Child. 79:475 (March) 1950. Caffey, J.: Chronic Poisoning Due to Excess of Vitamin A, Pediatrics 5:672, 1950.

Right Femur: Faint cortical thickening along the medial aspect of the middle third.

Right Fibula: Slight hyperostosis in the midshaft laterally.

Left Tibia: Cortical hyperostosis along the lateral and anterior aspects of the proximal end of the shaft. Adjacent soft tissue was swollen.

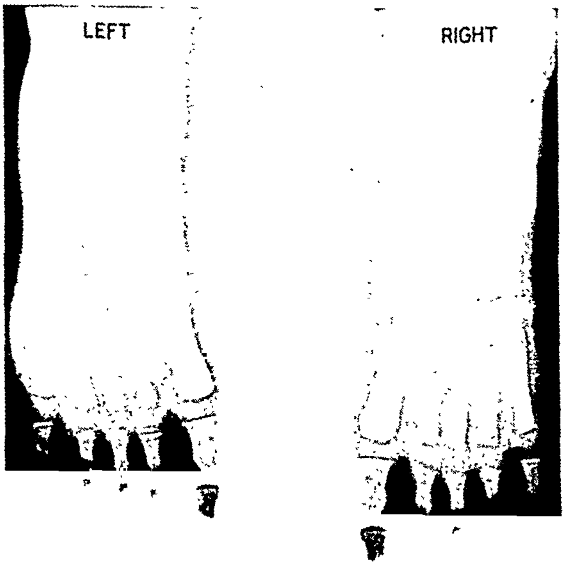

Fig. 3.—Metatarsal regions, both feet, showing lesions and soft tissue swelling over left fifth metatarsal.

Left Fifth Metatarsal: Moderately extensive cortical hyperostosis along the entire shaft. Considerable soft tissue swelling was present in this region.

New bone formation was also seen in the left third and fourth metatarsals and fourth right metatarsal.

Skull: Distinct periosteal new bone formation, less dense than the bones of calvarium, homogenous in character, and similar to hyperostosis present in the long bones. The largest patch of cranial hyperostosis was on the undersurface of the occipital bone extending to and on the left side of the foramen magnum. Smaller, more discrete areas of denser hyperostosis were present in each temporal region, and were more marked on the left side.

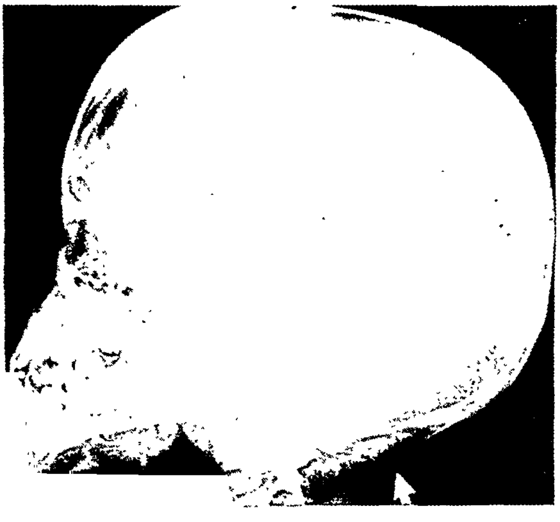

Fig. 4.—Skull, showing large patch of hyperostosis on undersurface of occipital bone.

Subsequent Course.—All vitamin supplements and excessive amounts of butter were eliminated from the diet. Within three days the child was able to walk, even though the metatarsal swelling had become more pronounced. The child appeared happy and seemed to be greatly improved. One month later, the metatarsal swelling was practically gone. The swellings of the forehead were still present, but were no longer painful or tender. In roentgen films made at the same time, all the hyperostoses except those in the skull had disappeared. Blood vitamin A level was 750 I. U.

COMMENT

Through a misunderstanding on the part of the grandmother, a teaspoonful of percomorph liver oil was given instead of 20 drops. Thus the child received in excess of 4 gm., or 240,000 units, of vitamin A daily during a period of at least three months. Prolonged continuous administration seems to be necessary before symptoms appear in children. Because of this, the administration for long periods of large doses of vitamin A in the treatment of skin diseases would seem to be a potentially dangerous procedure.

Although 14 cases have been reported, only two others showed swelling in the head. Neither of these cases showed as marked periosteal involvement as the one described above. The location of new bone formation on the undersurface of the occipital bone has never been reported previously. After one month, x-ray of the skull still revealed marked hypertostosis. Apparently new bone formation in this area persists longer than in other affected bones. Bony proliferation and high vitamin A levels were present for some time after the patient was otherwise normal.

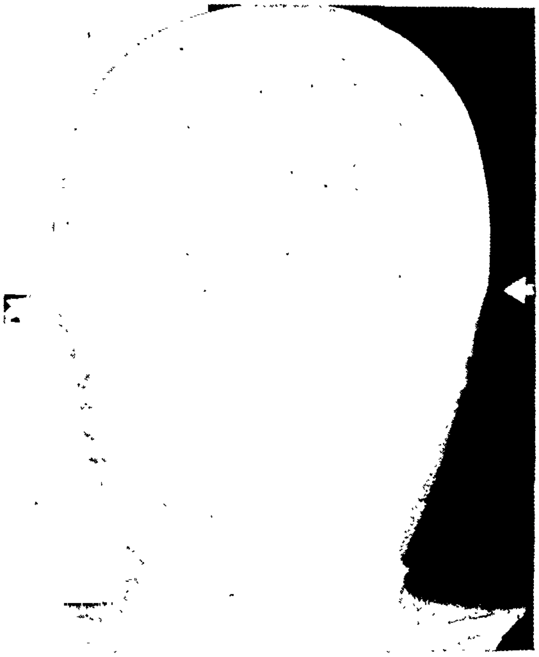

Fig. 5.—Skull, showing bilateral temporal hyperostoses.

SUMMARY

A case of hypervitaminosis A with the typical findings and an unusual cranial bone involvement is presented.

Because of the dangers of overdosage, caution is advised in the administration of vitamin A as a standard procedure in the feeding of healthy infants.

The prognosis in recognized cases is excellent after stoppage of excess vitamin A.

123 E. 83rd St.

SPLENIC ASPIRATION

CLINICAL AND HEMATOLOGICAL CONSIDERATIONS BASED ON OBSERVATIONS IN ONE HUNDRED FIVE CASES

Maurice Morrison, M.D., A. A. Samwick, M.D., Joshua Rubinstein, M.D., Henry Morrison, M.D.
and
Leo Loewe, M.D., Brooklyn

An authoritative monograph by Emile Weil,[1] entitled "La ponction de la rate," marked the beginning of definitive findings in normal and pathological hematological conditions. This was followed by Moeschlin's splendid monograph,[2] which brought the subject up to date and served to stimulate others in furthering the study of spleen aspiration. Influenced by these researches, it was our intention to make a diagnostic study of spleen aspiration in hematological material that presented itself to us in hospital, clinic, and office. The scope of this contribution is limited to our own observations, since the literature has been adequately reviewed by Block and Jacobson.[3]

The time-honored examination of the peripheral blood, coupled with an adequate clinical investigation, sufficed to make possible the diagnosis of most hematological entities. In this manner, disorders of the red blood cells, white blood cells, and platelets were readily apparent. Anemias, erythrocytosis, agranulocytosis, leukocytosis, lymphocytosis, thrombocytopenia, and leukemia could thus, to a great extent, be readily resolved.

However, cryptic anemias, osteosclerosis, myelophthisic anemias, myelomas, Gaucher's disease, Niemann-Pick disease, and spent polycythemias were recognized with difficulty, mostly by implication. With the advent of bone-marrow aspiration, the solution to the problem was closer at hand.

As time went on, an impasse was reached in the diagnosis of extramedullary hematopoiesis, such as obtains in spent polycythemias and osteosclerotic anemias due to various causes. It was also difficult to differentiate between spent polycythemias and myelogenous leukemias. As a result, this led, oftentimes, to the erroneous conclusion that polycythemias resulted in myelogenous leukemias.

Also, it was taxing, many times, to resolve the causes of the various splenomegalies. Could we always be sure of an instance of Gaucher's disease which was limited to the spleen and escaped the bone marrow? Was it previously possible, before death, to postulate a diagnosis of lymphosarcoma of the spleen? How sure were we of the diagnosis of the various hemolytic anemias associated with splenomegaly? Thus, it became apparent that more knowledge concerning the hematological mechanisms was indispensable. It happens that the solution of the problem was not too far off. Moeschlin's[2] brilliant treatise on the subject was very stimulating, although Emile Weil[1] preceded this work and established the foundation for all future researches in spleen hemopathology.

METHOD OF SPLEEN ASPIRATION

Procedure.—The apparatus required are a 20-gauge needle, a dry syringe, and an alcohol sponge; no anesthesia is necessary. The operator stands at left side of patient and "shakes hands" with the spleen. The patient is told to stop breathing. The operator enters the spleen area close to the costal margin at the midclavicular line. He should aspirate rapidly, withdrawing the syringe and needle promptly. Then he should make a smear of aspirate (usually one drop of material).

The total time of procedure is from five to 10 sec.

As here noted, the procedure is innocuous. We attribute this element of safety to the fact that we limited ourselves only to spleens large enough to permit the abdominal approach, and did not use the thoracic approach sometimes employed by others. We never, to our knowledge, encountered the complication of puncturing the gastrointestinal tract. We believe this to be owing to the fact that a large spleen normally depresses the abdominal viscera in its vicinity. Also, bleeding tendencies were avoided in these large spleen cases. No extra preparation was required before a splenic aspiration. An enema might well be given as an extra precaution, but we never found it necessary. If aspiration did not yield sanguinous fluid, we never hesitated to repeat the procedure at once.

In one instance clear fluid which demonstrated pancreatic amylase was obtained. The mass in the left upper quadrant was not spleen, but later turned out to be a pancreatic cyst.

The approach here is mainly hematological, so that the unit of diagnosis was the cell rather than the tissue, thus delimiting the field between the hematologist and pathologist. The objective sought for in this contribution was adjunctive, not substitutive. Thus, an opportunity for earlier diagnosis, during life, could be achieved. The necropsy still remained the *sine qua non* for definitive, unequivocal diagnosis.

Splenectomy and necropsy serve to confirm the findings of spleen aspiration. This was found true in nine splenectomies and two necropsies resorted to in this study. Furthermore, 19 of these patients had lymph-node

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Aided by a grant of funds from the Jacques Loewe Research Foundation, New York City.

From the Department of Hematology and the Department of Medicine, the Jewish Hospital of Brooklyn.

Exhibits of method by Drs. Maurice Morrison, A. A. Samwick, Joshua Rubenstein, and Leo Loewe: *Spleen and Lymph Node Aspirations in Hematology,* International Congress of Hematology, Cambridge, England, August, 1950; Spleen and Lymph Node Aspirations in Hematology, American Society of Clinical Pathologists, Chicago, October, 1950; Splenic Aspiration and Extra-Medullary Hematopoiesis: The Question of Splenectomy, Association of American Military Surgeons, New York, November, 1950.

[1] Weil, P.: Isch-Wal, P., alnd Perlés, S.: La ponction de la rate, Paris, Masson & Cie, 1936.

[2] Moeschlin, S.: Die Milzpunktion, Basel, Benno Schwabe, 1947.

[3] Block, M., and Jacobson, L. O.: *Splenic Puncture,* J. A. M. A. 142:641 (March 4) 1950.

aspirations; in two patients the conventional surgical lymph-node biopsy was done.

The following tabulation shows the distribution of conditions, based on clinical and hematological observations, in 105 cases of splenic aspiration.

Leukemia	
Eosinophilic	1
Acute myeloblastic	7
Chronic myelocytic	7
Chronic lymphatic	16
Lymphosarcoma cell	1
Lymphosarcoma	15
Hodgkin's disease	3
Osteosclerotic anemia	9
Polycythemia vera	7
Hemolytic anemia	3
Congenital hemolytic icterus	3
Banti's syndrome	3
Passive congestion of spleen	3
Cirrhosis of liver	3
Lymphnodulitis	3
Gaucher's disease	2
Giant lymphfollicular hyperplasia	2
Lipoid dystrophy	1
Gastrointestinal bleeding (postgastrectomy)	1
Hemangioma of spleen	1
Subacute bacterial endocarditis	1
Splenic vein thrombosis	1
Cooley's anemia	2
Hepatitis	1
Infection	1
Cardiac failure	1
No blood dyscrasia	6
Congenital telangiectasia	1
Total	105

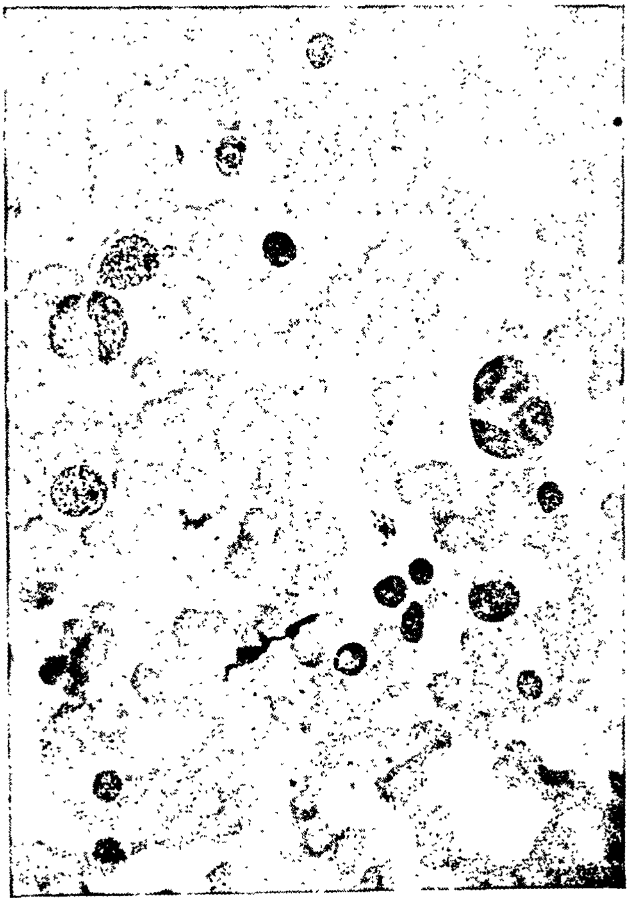

Fig. 1.—Spleen aspiration—Hodgkin's disease (Case L. C.). Monocytoid forms of Reed-Sternberg cells may be seen. Lymph-node aspiration was negative at this time.

The diagnosis in all cases was made by exposing the patients involved, whenever possible, to a battery of procedures as follows: (1) peripheral blood studies; (2) bone-marrow studies; (3) spleen aspiration; (4) lymph-node aspiration (where possible); (5) lymph-node biopsy (where possible); (6) pathological study of spleen after splenectomy, and (7) necropsy.

The types of cells noted above (Table 1) were found in this study and are but briefly described. Through the experience gained in this series of cases and a similar opportunity gained in viewing these cells in a number of cases with lymph-node aspiration (making a total of 206 experiences), we were able to orient ourselves adequately with the cytomorphological characteristics of these elements. After this study, we felt confident in setting down tentative criteria for the diagnosis of splenic aspirations in the different conditions.

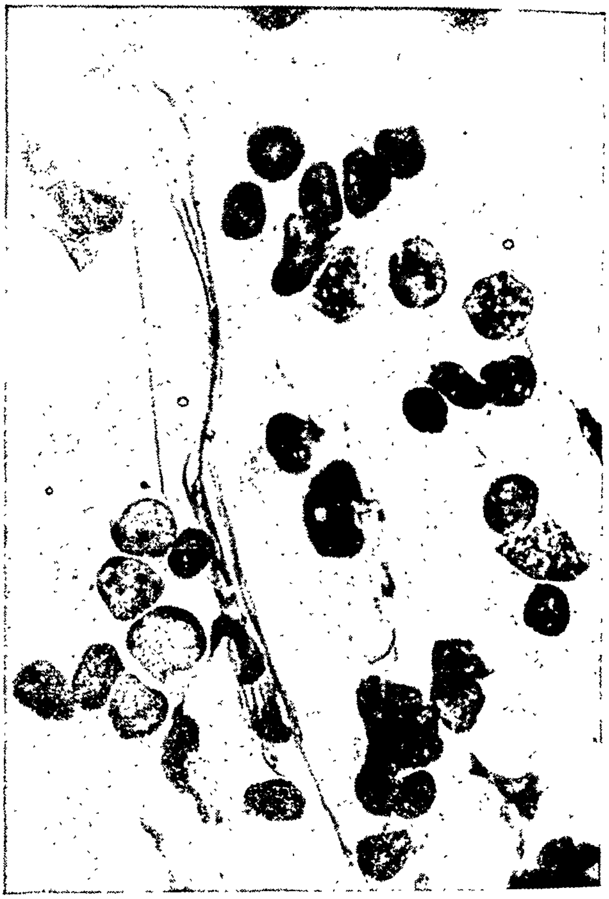

Fig. 2.—Lymph-node aspiration—lymphosarcoma (Case M. Y.). Large cell elements, scant cytoplasm, and absence of nucleoli can be seen. Type of cell above shown is the same as that found in spleen aspiration.

Criteria (cytomorphological) for the diagnosis of splenic aspirations have been briefly outlined in the previous table (Table 2). As will be noted, the following conditions have been characterized: (1) Hodgkin's disease, (2) lymphosarcoma, (3) lymphatic leukemia, (4) myelogenous leukemia, (5) giant lymphfollicular hyperplasia, (6) presence of extramedullary hematopoiesis, (7) absence of extramedullary hematopoiesis, and (8) Gaucher's disease.

REPORT OF CASES

Hodgkin's disease (three cases).—The unit cell is the Reed-Sternberg cell. The presence of an increase in monocytoid cells is suggestive (Fig. 1).

Patient L. C., a woman aged 56, presented pallor, enlarged nodes in the axillary and inguinal regions, a mass in the right upper quadrant, liver enlarged 1 fingerbreadth and spleen enlarged 2 to 3 fingerbreadths below the costal margin. On examination, the peripheral blood showed a hemoglobin value of 73%, 4,200,000 red blood cells per cubic millimeter, 7,400 white blood cells, with a differential count of 74% polymorphonuclear leukocytes, 23% lymphocytes, and 3% monocytes, and 3 + platelets.

Bone-marrow aspiration revealed a G:E ratio of 75:25, and 25% myelocytes, 10% metamyelocytes, 10% staff cells, and 55% polymorphonuclear leukocytes, with 3+ megakaryocytes.

Lymph-node aspiration showed 90% small and large lymphocytes and 10% polymorphonuclear leukocytes, with no Reed-Sternberg cells. Splenic aspiration revealed 20% polymorphonuclear leukocytes and 80% small and large lymphocytes, with 2+ Reed-Sternberg cells, 1+ monocytoid cells, 1+ macrophage cells, and 1 + reticulum cells.

Comment.—This case throws a glimpse at an interesting problem in spleen and lymph-node aspirations. An earlier lymph-node aspiration did not reveal definitive evidence of Sternberg-Reed cells, whereas a spleen aspiration done at the same time disclosed their presence. At a later time, a conventional surgical biopsy was positive for Hodgkin's disease. This emphasizes the point that the definitive findings of Hodgkin's disease not only vary in their onset, from lymph node to spleen, but also from one lymph node to another. This confirms the previously known nature of Hodgkin's involvement. In other words, one may state categorically that negative findings resulting from examination of a lymph node do not rule out the possibility of Hodgkin's disease in a given case. It is possible that the evidence may be present in another site or may make its appearance later on at the same site (Fig. 1).

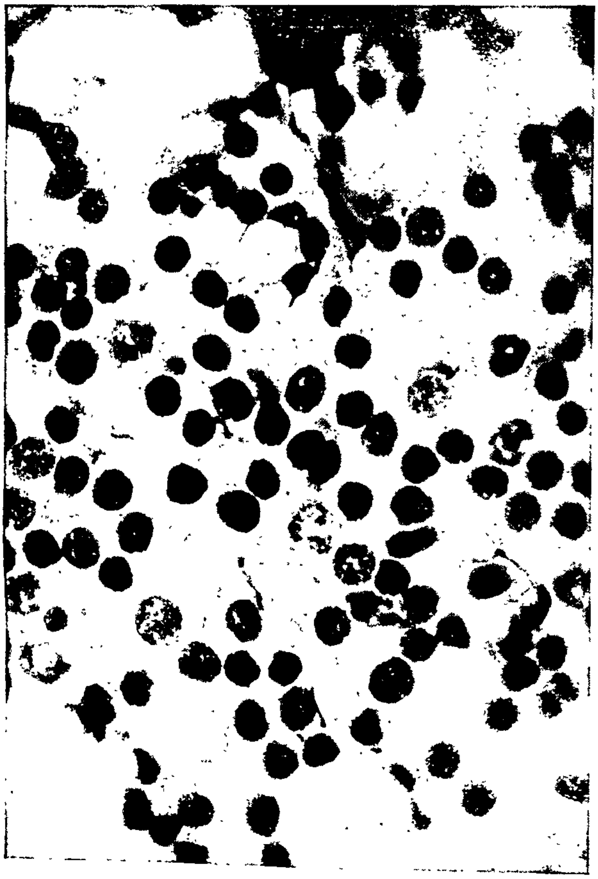
Fig. 3.—Spleen aspiration—chronic lymphatic leukemia (Case A. G.). Grumelée cell (typical mosaic or checkerboard or cartwheel appearance of nucleoplasm) can be seen.

Lymphosarcoma (15 cases).—The unit cell is the lymphosarcoma cell. It is usually the size of a large lymphocyte with scant cytoplasm and no nucleoloi. This cell is well depicted in the lymph node of case M. Y.

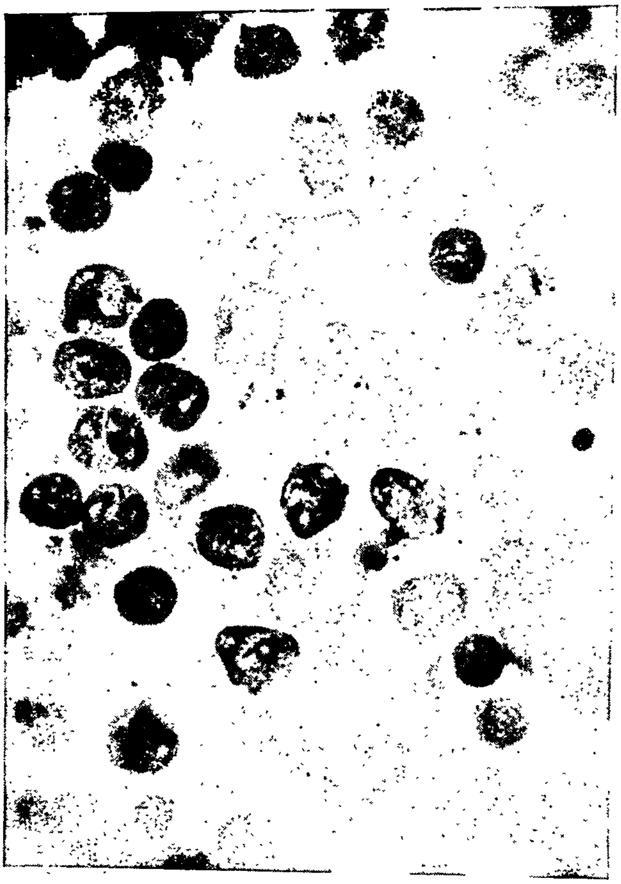
Fig. 4.—Spleen aspiration—acute myelogenous leukemia (Case J. L.). Myeloblasts and smudges may be seen.

Patient E. L., a man aged 57, presented marked pallor and weakness. The spleen was 3 to 4 fingerbreadths and the liver 2 to 3 fingerbreadths below the costal margin. Peripheral blood studies showed a hemoglobin value of 45% with 3,000,000 red blood cells; a white blood cell differential count of 72% polymorphonuclear leukocytes, 24% lymphocytes, and 4% monocytes, and 3 + platelets.

Bone-marrow aspiration revealed a G:E ratio of 20:80 and an L:E ratio of 75:25 and 25% myelocytes, 15% metamyelocytes, 20% staff cells, and 40% polymorphonuclear leukocytes.

Splenic aspiration showed 3 + small leukocytes; no lymphoblasts, Grumelée cells, or Reed-Sternberg cells, and many lymphosarcoma cells.

Comment.—Clinically, this case brought up for consideration various possibilities: (1) lymphocytic leukemia, (2) myelogenous leukemia, (3) Hodgkin's disease, (4) giant lymphfollicular hyperplasia, (5) lymphosarcoma.

Lymphatic leukemia was dismissed because of the lack of lymphocytosis in the peripheral study. Myelogenous leukemia was dismissed because of the absence of a left shift in the peripheral blood, bone marrow, and spleen. Hodgkin's disease was ruled out of consideration because of the absence of lymph-node enlargement and the absence of Sternberg-Reed cells in the spleen. Giant lymphfollicular hyperplasia was ruled out because of the absence of lymph-node enlargement, but here the question of lymphosarcoma loomed large, and the diagnosis was favored because of the presence of lymphosarcoma cells. However, it must be confessed that one cannot be dogmatic in these instances just on clinical grounds. The pathological diagnosis is still of paramount importance in distinguishing between the two. The rapid deterioration of the patient both clinically and hematologically favored the diagnosis of lymphosarcoma.

Lymphatic Leukemia (16 cases).—Chronic Lymphatic Leukemia: The unit cell is the Grumelée cell (Fig. 3). It has a typical checkerboard appearance.

Acute Lymphatic Leukemia: Here the unit cell is the lymphoblast. This cell is usually endowed with nucleoli. This point is very helpful in contradistinction to their absence in lymphosarcoma.

Patient A. G., a woman aged 62, was admitted with moderate pallor, and purpura of the lower extremities. She presented enlarged nodes in the axilliary, inguinal and cervical regions. The spleen was enlarged to from 3 to 4 finger breadths below the costal margin and the liver was enlarged to 2 finger breadths below the costal margin. Peripheral blood studies showed a hemoglobin value of 67% with 3,480,000 red blood cells, 576,000 white blood cells, 300,000 platelets, 10% lymphoblasts, 83% lymphocytes, and 7% polymorphonuclear leukocytes. Bone-marrow aspiration showed a G:E ratio of 95:5; G:L ratio of 15:85, and 3 + megakaryocytes, and 3 + smudge cells.

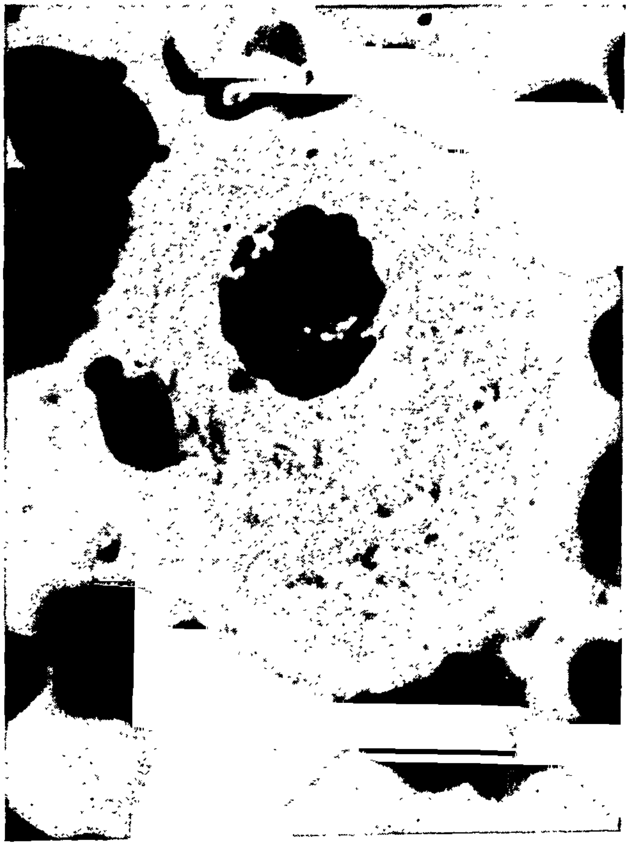

Fig. 5.—Spleen aspiration—Gaucher's disease (Case B. L.). Detailed study of cell can be noted. Here cytoplasmic structure is fibrillary as contrasted to the foam-like cytoplasm of the Niemann-Pick cell.

Lymph-node aspiration revealed 10% small lymphocytes, 80% Grumelée cells, and 10% lymphoblasts.

Splenic aspiration revealed 5% lymphoblasts and 95% Grumelée cells.

Comment.—The splenic aspiration did not reveal any information not already noted in the peripheral blood or lymph-node aspiration studies. Suffice it to say that lymphoblasts made their appearance in this case in all three media. This case is revealing in that it sheds light on the parallelism that occurs in these tissues, very much unlike that noted, for instance, in Hodgkin's disease, in which the degree of involvement is so variable in one site as compared to another.

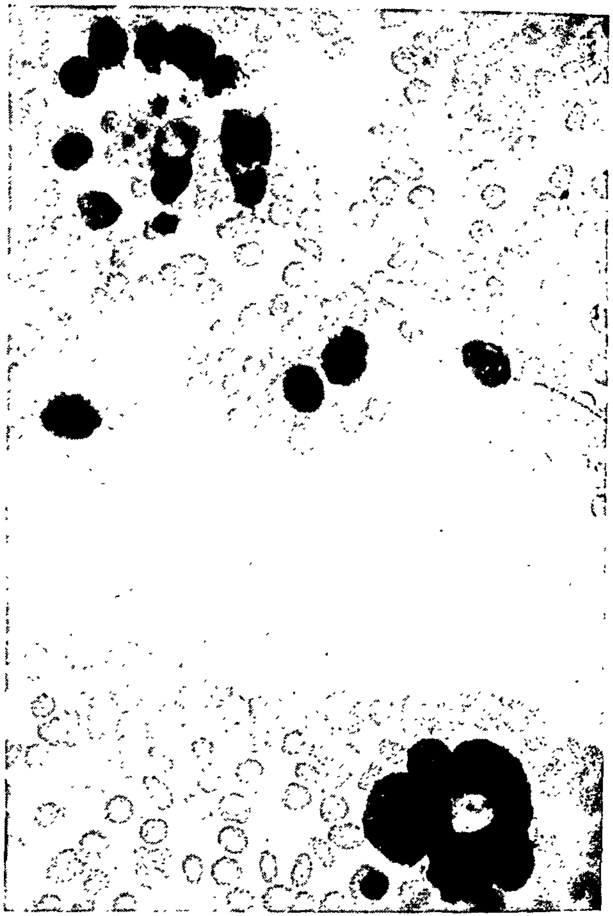

Fig. 6.—Spleen aspiration—spent polycythemia (Case L. G.). Large cluster of nucleated red blood cells above and megakaryocyte below can be seen.

Myelogenous Leukemia (seven cases).—The unit cell is the myelocyte in the chronic form and the myeloblast in the acute form (Fig. 4).

Patient A. B., a woman aged 50, was admitted with pallor and fever and presented extreme adenopathy, ascites, spleen enlarged 4 +, and liver enlarged 3 +. Studies on the peripheral blood showed a hemoglobin value of 66%, 3,600,000 red blood cells, 160,000 white blood cells, with a differential count of 5% myeloblasts, 60% myelocytes, 10% metamyelocytes, and 20% staff cells. Bone-marrow aspiration revealed 20% myeloblasts, 30% myelocytes, 10% metamyelocytes, 20% staff cells and 20% polymorphonuclear leukocytes, and *no* megakaryocytes (none on smear). The lymph-node aspiration and the splenic aspiration showed myeloblastosis (myeloblasts and myelocytes).

Comment.—The peripheral blood and bone-marrow, lymph-node, and splenic aspirations revealed essentially the same findings. This sheds light on the parallelism already noted in the case of lymphatic leukemia. Diagnostically, therefore, the spleen aspiration here serves a small purpose.

Giant Lymphfollicular Hyperplasia (two cases).—The picture is the same as that noted in lymphosarcoma.

Gaucher's Disease (two cases).—A case is presented as follows:

Patient B. L., a man aged 32, presented pallor, subicteric tint to the sclerae, and conjunctival pingueculae. The spleen was enlarged 4 to 5 fingerbreadths below the costal margin, and the liver extended 3 fingerbreadths below the costal margin. There were a few cervical nodes present. The splenomegaly was noted 20 years previously when the patient was aged 12 years, and the diagnosis was made then.

On study, the peripheral blood showed a hemoglobin value of 80%, and 5,000,000 red blood cells, 6,000 white blood cells, with a differential count of 68% polymorphonuclear leukocytes, 2% eosinophils, 27% lymphocytes, and 3% monocytes, and 100,000 platelets.

Bone-marrow aspiration revealed a G:E ratio of 60:40 and many Gaucher cells. Splenic aspiration showed many Gaucher cells (Fig. 5).

TABLE 1.—*Description of Cell Types Noted in Spleen Aspirates in this Study*

Cell Type	Frequency	Occurrence	Description
Small lymphocyte	85%	Normal	Same as in peripheral blood
Large lymphocyte	15%	Normal	Same as in peripheral blood
Reticulum cell	Occas.	....	Large nucleus (2 to 3 × size of small lymphocyte) surrounded by irregular cytoplasmic processes
Syncytial cell	Occas.	....	Groups of reticulum cells in masses with common bluish cytoplasmic background
Grumelée cell (Fig. 3)	Many	Lymph. leuk.	Lymphoid elements with checkerboard nucleus
Lymphoblasts	Occas.	Normal inflammations	Lymphoid elements with nucleoli
I. M. cells	Many	Infectious mononucleosis	Large lymphoid elements with indented nucleus and bluish cytoplasm
Myeloblasts (Fig. 4)	Many	Myelosis	Same as in peripheral blood
Monocytoid cells	Occas.	Hodgkin's disease	Like monocytes in peripheral blood occas. with more than one nucleus, Reed-Sternberg cells
Erythroid elements	Many	Extramedullary hematopoiesis, osteosclerotic anemia, spent polycythemia	Same as those seen in peripheral blood and bone marrow

Comment.—This case shows the benignity of Gaucher's disease. The patient was active all his life, but in the last six months found that the mass in his left side of the abdomen was interfering with his daily routine. The spleen was removed because of size.

It is interesting to note that the spleen was definitely more involved than the bone marrow. It seems possible, therefore, that a diagnosis may sometimes be delayed if the bone marrow alone is examined. Splenic aspiration, therefore, serves a definitely useful purpose in Gaucher's disease.

Extramedullary Hematopoiesis.—It is best that we define this term as used in this study. This serves to identify the presence of immature erythrogenetic elements, immature myeloid elements, or megakaryocytes (Fig. 6). Furthermore, the presence of lipoid or other histiocytic components may be included under this category. Such conditions as Gaucher's disease, Niemann-Pick disease, Hand-Schüller-Christian disease and Lederer-Siewe disease may thus be mentioned here.

It is well to stress the significance of extramedullary hematopoiesis. It appears, we believe, as a compensatory phenomenon in response to a failing marrow (osteosclerotic, myelosclerotic, myelophthisic).

Thus it is most frequently present in osteosclerotic anemia and spent or late polycythemia.

TABLE 2.—*Tabulation of Criteria in Splenic Aspirations*

I. Hodgkin's disease
  A. Reed-Sternberg cells
  B. Increase in monocytoid cells
  C. Presence of eosinophiles
  D. Polynuclears present from 10 to 50
  E. Increase in large lymphoid elements (normal ratio of small to large lymphoid elements S:L is 90:10; here S;L is 30:70)
  F. Reticulum cells—1+ to 2+
II. Lymphosarcoma
  A. Large lymphoid elements increased (S:L is 10:90). These have large nucleus, rare nucleoli and scant cytoplasm (no checkerboard appearance)
  B. Mitotic figures are prominent
  C. Occasional hemohistioblasts seen
III. Giant lymphfollicular hyperplasia
  Same as lymphosarcoma with addition of occasional monocytoid and small lymphoid elements
IV. Lymphatic leukemia
  A. Chronic
    1. Small lymphoid elements (Grumelée cells) increased (S:L is 90:10). These cells are medium-sized and have a checkerboard appearance
    2. Large lymphoid elements are rare
    3. No polynuclears seen
  B. Acute
    1. Few Grumelée cells seen
    2. Preponderance of lymphoblasts with nucleoli
    3. Rare mitotic figures
  C. Subacute
    1. Grumelée cells and lymphoblasts equal in number
V. Myelogenous leukemia
  A. Chronic—Myelocytosis (90% of cells present)
  B. Acute—Myeloblastosis (90% of cells present)

VI. Extramedullary hematopoiesis present	Myeloid	Erythroid	Lymphoid	Lipoid, Gaucher Niemann-Pick	Megakaryocytic
A. Osteosclerosis					
1. Early polycythemia	+	+	—	—	+
2. Late polycythemia	+	+++	—	—	+++
B. Leukemia with myelosclerosis...	+++	±	—	—	—
C. Myelogenous leukemia	+++	±	—	—	±
D. Lymphatic leukemia	—	—	+++	—	±
E. Osteosclerotic anemia	++	++	—	—	+
F. Gaucher's disease	—	—	—	+++	—
G. Niemann-Pick disease	—	—	—	+++	—
VII. Absence of or minimal extramedullary hematopoiesis					
A. Familial hemolytic anemia....	—	—	—	—	—
B. Acquired hemolytic anemia....	—	—	—	—	—
C. Cooley's anemia	—	—	—	—	—
D. Sickle cell anemia...............	—	—	—	—	—

Spent Polycythemia Versus Leukemia.—The following case is an illustration.

Patient L. G., a woman aged 38, presented anemia, inability to walk, an enlarged spleen 4 to 5 fingerbreadths below the costal margin, and an enlarged liver about the same size. There was a past history of polycythemia of 10 years' duration followed by hemiplegia. The peripheral blood showed a hemoglobin value of 58%, 3,007,000 red blood cells, 7,650 white blood cells, and 200,000 platelets.

Bone-marrow aspiration showed sparse marrow, relative erythroblastosis, smudges, and toxic elements.

Splenic aspiration revealed extramedullary hematopoiesis with 2 + erythrogenesis, and 1 + leukogenesis.

Necropsy showed erythroblastosis and a leukemoid reaction in all the reticuloendothelial organs.

Comment.—This case points out the important relationship of osteosclerosis to splenic hematopoiesis in a case of spent polycythemia of 10 years' duration. Also, one takes a glimpse at nature's effort of "treating" polycythemia vera in its own way, by producing a space-consuming lesion in the bone marrow, mediated through a progressive fibrosis and resultant osteosclerosis. This case also brings to the fore the old controversy of polycythemia vera and leukemia. Does one transform itself to the other? Splenic aspiration, as exemplified in this case, brings out the inherent erythrogenetic quality (secondary to complicating osteosclerosis) as opposed to a primary leukogenetic quality expressed in a leukemic process. We feel that our experience with splenic aspiration helped us to better understand this controversial issue.

Absence or Minimal Hematopoiesis.—Contrary to our preconceived ideas, we were surprised to find little or no hematopoiesis in the hemolytic anemias. This was true in all hemolytic anemias, Cooley's anemia and, undoubtedly, in sickle cell anemia.

Patient G. P., a woman aged 36, presented anemia, icteric tint to sclerae, and a spleen enlarged to below the umbilicus; splenectomy was done.

Studies on the peripheral blood revealed a hemoglobin value of 40%, and 1,770,000 red blood cells, 300,000 platelets, and 7,300 white blood cells, with a differential count of 78% polymorphonuclear leukocytes, 16% lymphocytes, and 6% monocytes.

Bone-marrow aspiration revealed a G:E ratio of 40:60 and an E:N ratio of 70:30 and 3 + megakaryocytes, 36% myelocytes, 18% metamyelocytes, 18% staff cells, and 28% polymorphonuclear leukocytes.

Splenic aspiration showed no evidence of erythrogenesis, leukogenesis, or platelets. Pathologist's report of spleen revealed "no evidence of hematopoiesis—a diagnosis compatible with hemolytic icterus."

Comment.—This is an instance of the lack of hematopoiesis (extramedullary) in a case of proven hemolytic icterus. The pathological report of the removed spleen confirmed the diagnosis. It is interesting to note that the lack of hematopoiesis is a constant feature in the hemolytic anemias. Thus, we are not surprised to discover similar features in Cooley's anemia and sickle cell anemia. This finding affords us another point in a differential between the splenomegaly of hemolytic origin as compared to those of osteosclerotic origin. As a matter of fact, it can be stated categorically that the presence of hematopoiesis in a spleen is proof against a diagnosis of hemolytic anemia. This finding was concurred in by *Moeschlin.*[4]

COMMENT

Spleen aspiration has become an important addition to our diagnostic armamentarium in hematological conditions. It is interesting to note in this connection (Table 3) that in the 105 cases studied with spleen aspiration it was possible to make an adequate diagnosis by blood alone in 29 cases. In 32 cases the combined bone-marrow and peripheral blood studies led to the diagnosis. In 102 out of 105 cases, the combined spleen aspiration with the bone-marrow and peripheral blood studies led to the correct diagnosis. Thus, it may be seen that at the present time the hematologist has at his command the utilization of four avenues of approach to a clinico-hematological problem, i. e., the blood, the bone-marrow, the lymph-node, and the splenic aspiration. Certain conditions previously difficult to diagnose ante-mortem become very easily identified. These are (1) osteosclerotic anemia, (2) extramedullary hematopoiesis, (3) Gaucher's disease (especially if absent in the bone marrow), and (4) spent polycythemia.

Again, it is generally accepted that splenectomy is contraindicated if the spleen shows hematopoiesis. In these circumstances, it is imperative to ascertain whether extramedullary hematopoiesis is absent before contemplating splenectomy. This can easily be done by splenic aspiration. Thus, the surgeon has still another precaution to observe before attempting splenectomy.

SUMMARY

A series of 105 splenic aspirations is reported and analyzed, and the technique of splenic aspiration is described. Criteria for the diagnosis of hematological conditions by splenic aspiration are outlined. Diagnosis by splenic aspiration is made possible in conditions heretofore identified only at operation (splenectomy) or necropsy.

TABLE 3.—*Comparative Diagnostic Value of Studies of Peripheral Blood, Bone-Marrow, and Splenic Aspiration in 105 Cases with Splenomegaly*

Diagnosis Established by	No. of Patients	Percentage Correct Diagnosis
Peripheral blood alone	29	27.6
Bone marrow and peripheral blood combined	32	30.5
Splenic aspiration, bone marrow and peripheral blood	102	97.2

Another means of studying extramedullary hematopoiesis is offered. Splenic aspiration as a precautionary measure prior to splenectomy, to exclude hematopoiesis, is presented. Hemolytic icterus, Cooley's anemia, sickle cell anemia, and other hemolytic anemias do not present significant splenic hematopoiesis.

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Thirst.—Two theories have been advanced to explain the mechanism by which the sensation is aroused. . . . According to one view, thirst is due simply to the drying of the pharyngeal mucous membrane, the salivary glands being given a role in the regulation of the water balance of the body. When the water content of the body falls below a certain level salivary secretion is depressed, the consequent drying of the mucous membrane of the throat then elicits the characteristic sensation. If such a view is correct, drying of the pharyngeal mucosa from whatever cause should cause thirst. . . . According to the other view, thirst is a sensation resulting from changes in blood composition, probably to a rise in its osmotic pressure, which stimulates the afferent nerve endings; or acts perhaps upon central nervous structures. . . . Neither theory alone explains all the experimental facts. It appears that the factors concerned in the production of thirst are both local and general. The importance of a rise in the osmotic pressure of the blood in causing the sensation is suggested by the experiments of Verney on water diuresis, for it is not unreasonable to suppose that thirst and the control of the water balance of the body through the antidiuretic principle of the pituitary are parts of the same mechanism.—Charles Herbert Best, M.D., and Norman Burke Taylor, M.D., The Physiological Basis of Medical Practice, Baltimore, The Williams & Wilkins Company, 1950, p. 606.

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[4] Moeschlin, S.: Personal communication to the authors.

COLLECTING SPECIMENS FOR THE LABORATORY DEMONSTRATION AND ISOLATION OF FUNGI

Libero Ajello, Atlanta

Clinical laboratory procedures in medical mycology are directed toward the demonstration and isolation of pathogenic fungi occurring in body tissues and fluids. The diagnostic laboratory, however, cannot function unless adequate specimens, properly collected and handled, are received.

This paper has been prepared to assist clinicians in the collection of appropriate specimens from patients suspected of having mycotic infection. In general, the procedures involved are simple, and no elaborate equipment is required.

The types of specimens needed to demonstrate these fungi and to isolate them from clinical materials will be described for the following groups of fungus infections, and for each specific disease.

SUPERFICIAL MYCOSES

These are fungus infections confined to the outermost layer of the skin and hair. The diseases included in this category are (1) erythrasma, (2) piedra, (3) tinea nigra, (4) tinea versicolor and (5) trichomycosis axillaris.

The mycotic nature of erythrasma, tinea nigra and tinea versicolor is established by the microscopic examination of skin scrapings obtained from suspected skin lesions. The affected area is prepared by a swabbing with a sponge soaked in 70% alcohol. This washing serves to remove dirt particles and any medication that would make microscopic examination difficult. After drying, the lesion is scraped with a sterile scalpel. The scales so obtained are placed in a small, sterile Petri dish and sent to the laboratory with all necessary data. For mailing to an outside laboratory, scrapings should be deposited on a piece of clean white paper that is carefully folded in the form of a packet to guard against loss of the material.

In suspected cases of trichomycosis axillaris, hairs are clipped from the axillary or pubic region, depending on the site of infection, and the specimen is sent to the laboratory in a Petri dish or a folded piece of paper.

In piedra, a mycotic infection of the hair of the scalp and beard, hairs are clipped from the areas involved and sent to the laboratory in a similar manner.

Cultures are not made in cases of erythrasma, tinea versicolor, and trichomycosis axillaris, as media have not yet been developed for isolating the causative agents. Their diagnosis is made solely on the basis of clinical impression and the demonstration of fungus elements in scrapings.

CUTANEOUS MYCOSIS

In this category are placed all those mycotic infections that involve the skin and hair to a greater extent than do the infections classified as superficial mycoses. These diseases, known as the dermatophytoses, include the following: (1) tinea pedis (athlete's foot); (2) tinea corporis (ringworm of the body); (2) tinea capitis (ringworm of the scalp); (4) tinea cruris ("jock itch," ringworm of the groin); (5) onychomycosis (nail infection); (6) candidiasis (moniliasis), and "thrush," paronychia and vaginitis.

In lesions involving the skin and nails, scrapings are obtained with a scalpel after careful washing of the site with alcohol. In ringworm infections of the smooth skin, it is important to collect the specimen from the active border of the lesions. Fungi grow in a centrifugal manner from the original point of infection and, as the fungus advances, a circular lesion is produced.

Hairs from suspected cases of tinea capitis are plucked out with tweezers. They are best obtained from the center of patches of infection that contain the stubs of infected hairs.

In scalp ringworm caused by species of Microsporum, the infected hairs fluoresce with a bright yellow-green color when exposed to ultraviolet light in a dark room. One can take advantage of this phenomenon by plucking the fluorescent hairs, thus insuring that only the infected hairs are collected and making isolation of the causative agent more certain. It is well to remember, however, that, in tinea capitis due to the trichophytons, infected hairs do not fluoresce brightly. Hairs from suspected lesions should be collected for culturing and microscopic examination regardless of the reaction to ultraviolet irradiation.

Skin and nail scrapings and hairs may be forwarded to the diagnostic laboratory in sterile Petri dishes or paper packets.

In suspected cases of Candida (Monilia) albicans infection, scrapings from the affected areas should be directly smeared on clean slides and, after drying, sent to the laboratory. In addition, several tubes of Sabouraud's dextrose agar should be inoculated with the material. Cotton swabs are not recommended for mailing, as they dry out in transit and hinder or even prevent the demonstration and isolation of fungi.

SUBCUTANEOUS MYCOSES

In this group are found the following diseases: (1) chromoblastomycosis; (2) mycetoma; (3) rhinosporidiosis, and (4) sporotrichosis. From this group of infections, clinical material of the following types may be used for laboratory examination: (1) pus from open abscesses; (2) exudate from draining sinus tracts; (3) material aspirated from subcutaneous abscesses and unopened sinus tracts, and (4) tissue taken for biopsy.

Such material should be placed in sterile vials or test tubes or, if mailed, inoculated on suitable media. There is an exception to this rule: scrapings and biopsy material from suspected rhinosporidiosis should be examined directly or fixed for histological examination. Media are not available for the culturing of the causative agent, Rhinosporidium seeberi.

SYSTEMIC MYCOSES

Systemic mycoses are caused by organisms that invade and attack the internal organs of the body, such as the lungs, liver, spleen, and kidneys. It must be remem-

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From the Laboratory Services, Communicable Disease Center, Public Health Service, Federal Security Agency.

bered, however, that cutaneous manifestations of these diseases do occur, and specimens in such instances are collected in a manner similar to that described for the cutaneous mycoses. The systemic human fungus infections are (1) actinomycosis (caused by Actinomyces bovis), (2) North American blastomycosis, (3) South American blastomycosis, (4) candidiasis (moniliasis), (5) coccidioidomycosis, (6) cryptococcosis (torulosis), (7) geotrichosis, (8) histoplasmosis, and (9) nocardiosis (caused by Nocardia asteroides).

Materials for laboratory examination in systemic diseases are obtained from such varied sources as blood, spinal fluid, sputum, exudates from draining sinuses and abscesses, sternal marrow, scrapings from edges of ulcers and abscesses, aspirated fluid from subcutaneous abscesses and sinus tracts, and tissue taken for biopsy.

These materials should be placed in sterile vials, Petri dishes or test tubes for transfer to the laboratory. For mailing purposes, they should be inoculated on suitable media. Smears may also be made.

Peripheral blood, spinal fluid, sternal marrow and aspirated fluids should, of course, be collected with strict sterile precautions and inoculated directly onto appropriate media and/or placed in suitable sterile containers prior to transfer to the laboratory.

LABELING OF SPECIMENS

To facilitate the work of the diagnostic laboratory the following data should accompany all specimens submitted: (1) patient's name, age, and sex; (2) hospital or other number assigned to the patient or specimen; (3) name and address of the physician or other official to whom laboratory report is to be sent; (4) type of material submitted and date collected, and (5) suspected disease.

This last item, the citing of the suspected mycotic disease, is very important, as it serves to guide the laboratory in the examination of the specimen. For example, in suspected cases of actinomycosis, cultures are made on special media and incubated anaerobically. Unless A. bovis is suspected as the causative agent, fungus cultures routinely are incubated aerobically.

MAILING OF SPECIMENS

For best results, only agar cultures should be mailed to a laboratory for mycological examination. With the exception of such materials as skin scrapings, nail clippings and hairs, most clinical specimens are valueless by the time they reach the laboratory. While in transit, sputum, urine, exudates from lesions, bronchial washings and biopsied tissue usually become so quickly overgrown with saprophytic organisms that the demonstration and isolation of any pathogenic fungus originally present are rendered impossible. Clinical materials of this type should be sent to the laboratory only as a last resort, when media are not available and even then in rubber-stoppered vials tightly sealed and carefully wrapped for mailing.

When cultures are forwarded to a reference diagnostic laboratory, it is advisable to mail only pure and selected fungus cultures. If several different fungus species appear in a tube, only those suspected of being pathogenic should be subcultured to fresh tubes and mailed. Laboratory workers should be familiar with the most common saprophytic fungi, members of such genera as Alternaria, Aspergillus, Penicillium and Rhizopus, and should discard them when they appear in their cultures, unless there are specific grounds for considering them pathogenic in any given instance.

To facilitate the handling of cultures by the diagnostic laboratory, it is recommended that test tubes of standard size (18 by 150 mm.) be used. Odd-sized tubes and bottles are inconvenient to handle and present storage problems. Since the growth of many fungi is inhibited in screw-capped tubes, all cultures should be cotton-plugged. Test-tube cultures must always be wrapped individually in cotton or paper before being placed in the mailing container. The free space in the mailing tube should then be packed with sufficient cotton or other material to prevent breakage. Material obtained under sterile conditions, such as blood, spinal fluid, and aspirated pus, may, if necessary, be shipped by mail, provided that they are collected in sterile, tightly sealed vials or tubes. Of course, such containers must be packed carefully.

Petri-dish cultures should never be sent through the mail as they almost invariably break in transit; neither should cotton swabs be mailed, since they usually become desiccated before arrival at the laboratory.

ISOLATION MEDIA

The following formulas of media are suggested for the primary isolation of pathogenic fungi:

1. *Sabouraud's Agar*

Purpose.—Isolation of most pathogenic fungi.

Composition.—The formula follows.

Dextrose	40.0 gm.
Peptone	10.0 gm.
Agar	15.0 gm.
Distilled water	1,000.0 ml.

Procedure.—Dissolve ingredients in a water bath; place 8 ml. in an 18 by 150 mm. test tube. Sterilize by autoclaving 10 minutes at 120 C., and slant. This medium is prepared in dehydrated form by several companies.

2. *Thiamine-Dextrose Agar*

Purpose.—Isolation of Trichophytons of the faviform group, including Trichophyton violaceum.

Composition.—The formula follows.

Dextrose	40.0 gm.
Peptone	10.0 gm.
Thiamine	0.001 gm.
Agar	15.0 gm.
Distilled water	1,000.0 ml.

Procedure.—Dissolve ingredients in a water bath; place 8 ml. in an 18 by 150 mm. test tube. Sterilize by autoclaving 10 minutes at 120 C., and slant.

3. *Blood Agar plus Antibiotics*

Purpose.—Isolation of Blastomyces dermatitidis, Blastomyces brasiliensis, Histoplasma capsulatum.

Composition.—The formula follows.

Brain-heart infusion [1]	37.0 gm.
Agar	20.0 gm.
Distilled water	1,000.0 ml.

Procedure.—Dissolve ingredients in a water bath; place 17 ml. in a 25 by 150 mm. test tube. Autoclave at 120 C. for 10 minutes. Cool to 50 C. and add aseptically

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[1] Brain-heart infusion is prepared in dehydrated form by several companies.

1.0 ml. of blood, 340 units of penicillin and 680 units of streptomycin per tube, and slant.

4. Brain-Heart Infusion Agar

Purpose.—Isolation of A. bovis (shake tubes).

Composition.—The formula follows.

Brain-heart infusion[1]	37.0 gm.
Agar	15.0 gm.
Distilled water	1,000.0 ml.

Procedure.—Dissolve ingredients in a water bath; place 8 ml. in an 18 by 150 mm. test tube. Sterilize by autoclaving 10 minutes at 120 C. Do not slant. To use, melt agar in a water bath, cool to 50 C., inoculate with a loop, mix thoroughly, allow to solidify, and incubate.

SUMMARY

The accompanying table summarizes the various types and sources of materials that are required by the laboratory for the successful demonstration and isolation of fungi in given types of fungus diseases.

Source of Specimens and Media Required for the Demonstration and Isolation of Fungi from Specific Types of Fungus Diseases

Disease	Type of Specimen	Isolation Medium
Superficial mycoses		
Erythrasma	Skin scrapings	None available at present
Piedra	Clipped hair	Sabouraud's dextrose agar
Tinea nigra	Skin scrapings	Sabouraud's dextrose agar
Tinea versicolor	Skin scrapings	None available at present
Trichomycosis axillaris	*Clipped hair*	None available at present
Cutaneous mycoses		
Candidiasis	(a) Skin scrapings (b) Scrapings from mucocutaneous areas (c) Vaginal scrapings	*Sabouraud's dextrose agar*
Onychomycosis	*Nail scrapings*	Sabouraud's dextrose agar
Tinea capitis	Plucked hair	(a) Sabouraud's dextrose agar (b) Thiamine-dextrose agar
Tinea corporis	*Skin scrapings*	(a) Sabouraud's dextrose agar (b) Thiamine-dextrose agar
Tinea pedis	Skin scrapings	Sabouraud's dextrose agar
Subcutaneous mycoses		
Chromoblastomycosis	(a) Crusts and scrapings from warty outgrowths (b) Exudate from lesions	Sabouraud's dextrose agar
Mycetoma	(a) Pus from draining (b) Aspirated fluids fro (c) Biopsy specimens	(a) Sabouraud's dextrose agar (b) Brain-heart infusion agar for actinomycotic mycetomas (shake tubes)
Rhinosporidiosis	(a) Biopsied nasal and *ocular polyps* (b) Skin	None available at present
Sporotrichosis	(a) Pus 1 (b) Aspir	Sabouraud's dextrose agar
Systemic mycoses		
Actinomycosis	(a) Pus from *draining sinuses* (b) Aspirated fluid from subcutaneous abscesses (c) Sputum (d) Spinal (e) Bronch	Brain-heart infusion agar; shake tubes
Blastomycosis, North American	(a) Scrapings *from edge of skin lesions* (b) Pus from open abscesses (c) Pus from sinus tracts (d) Urine (e) Sputum (f) Bronchial washings	(a) Sabouraud's *dextrose* agar (b) Blood agar plus antibiotics
Blastomycosis, South American	(a) Scrapings from edge of *skin lesions* (b) Scrapings from mucous membranes (c) Biopsied lymph nodes (d) Sputum (e) Bronchial washings	(a) Sabouraud's dextrose agar (b) Blood agar plus antibiotics
Candidiasis	(a) Sputum (b) (c) (d) (e)	Sabouraud's dextrose agar
Coccidioidomycosis	(a) Sputum (b) (c) (d) (e) [illegible] skin lesions (f) Pus from draining abscesses and sinuses	(a) Sabouraud's dextrose agar (b) Blood agar plus antibiotics
Cryptococcosis	(a) Spinal fluid (b) Sputum (c) Pus from abscesses (d) Pus from sinus tracts (e) Scrapings from skin *lesions* (f) Urine	Sabouraud's dextrose agar
Geotrichosis	(a) Sputum (b) Bronchial washings (c) Stools	Sabouraud's dextrose agar
Histoplasmosis	(a) Blood (b) Sternal marrow (c) Sputum (d) (e) (f) (g) Exudate from *ulcers* (h) Scrapings from *skin lesions*	(a) Sabouraud's dextrose agar (b) Blood agar plus antibiotics
Nocardiosis	(a) Sputum (b) Spinal fluid (c) Pus from *abscesses* (d) Bronchial washings	Sabouraud's dextrose agar
Miscellaneous mycoses		
Aspergillosis	(a) Sputum (b) Bronchial washings	Sabouraud's dextrose agar
Mucormycosis	(a) Sputum (b) Bronchial washings (c) Biopsy material	Sabouraud's dextrose agar
Penicilliosis	(a) Sputum (b) Bronchial washings	Sabouraud's dextrose agar

PSYCHIATRIC TECHNIQUES IN MEDICAL PRACTICE

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Psychiatry, as a medical specialty, today finds itself vastly oversold, in the sense that the public expects of it much more than it will be able to deliver for many years to come. As someone interested in the public health aspects of psychiatry, I want to discuss some of the things we can do to satisfy the psychiatric needs we see and the demands we have created. In the confusion besetting the field of mental health, I have attained at least two clear convictions. The first is that the medical profession will never do a satisfactory job of safeguarding and raising the health level of the population until it is in a position to contribute more effectively to mental and emotional health. The second is that such a contribution will never be made until the major portion of it can be made through the work of nonpsychiatric medical practitioners. Up to now the medical profession has restricted its work largely to the cure and prevention of those ills which are caused by bacteriological and toxic agents, degenerative processes, neoplasms, and other such physical factors. Until it broadens this approach, it will continue to neglect a major source of morbidity—that which results from emotional conflicts and tensions. Up to now this area has been left almost exclusively to psychiatrists, but it is a task which is impossible in its proportions for a small, specialized group. For the job to be done, it must be undertaken by the medical profession as a whole. I think it is nonsense to speak of the hundreds of thousands of psychiatrists who must be trained to take care of the emotional health of our population. The training of such numbers will be impossible to achieve—and economically impossible to maintain if it were achieved. Furthermore, such an overwhelming undertaking is unnecessary. What is necessary, what is possible, and what is altogether practical is that general practitioners and pediatricians, allergists, obstetricians, surgeons, and even roentgenologists, learn something about their patients' emotions and the role that these play in health and illness. Let me make it clear that I am not trying to turn all physicians into psychiatrists, nor am I suggesting that the specialty of psychiatry be abolished. Presumably, there will always be room for specialists who will occupy themselves with the study and treatment of emotional illnesses. However, the vast majority of persons who can be helped to better health through assistance with their emotional problems need not and should not go to psychiatrists. In the course of their ordinary contacts with medical practitioners, they have a right to expect that these physicians will have the wherewithal to assist them with the usual run of emotional ills. Such an expectation is not unreasonable, and if the medical profession applies itself to the task, it will be able to meet it with complete adequacy.

I have no illusions about the perfection or the completeness of today's psychological insights. There is a tremendous amount that even the best informed and most skillful psychiatrist does not know and cannot do. But in spite of these shortcomings psychiatrists do know certain things about mental and emotional development which can be utilized to make people healthier and happier. Furthermore, most of these things we know are of such a nature that they can be learned and effectively utilized by physicians who are not specialists in the field. And let me make it clear that when I speak of using psychological skills I refer to their application—not to the narrow field of severely neurotic patients or the somewhat broader field of patients with so-called "psychosomatic" symptoms—but I mean the utilization of these insights and skills in the case of every patient who enters a physician's office. It has become common knowledge that psychogenic factors play an important role in many more illnesses and with many more patients than was thought conceivable some 10 years ago. At that time, for example, even the best obstetricians thought they had done handsomely by a patient with repeated abortions when they had exhausted all the physical examinations, laboratory tests, roentgenograms and endocrinological studies that might reveal the source of the trouble. Now it is known that beyond what might be uncovered in such examinations, there are instances where a woman's unconscious inability to accept a pregnancy or the role of motherhood may be the real cause of the repeated abortions. Not so long ago the surgeon had done his duty when he repeatedly sewed up, splinted, or put into casts persons who somehow repeatedly got into accidents. Now it is known that an unconscious tendency to punish oneself, and a perverse satisfaction in the resulting suffering, play a large role in the causation of these repeated accidents. But even beyond instances of this kind, even where psychogenic factors play no part in the causation of the illness, it can still be said that every patient who suffers enough to come to a physician has some emotional reaction to his illness. And it is the physician who best understands this reaction who is best equipped to help the patient.

BARBITURATES

Let us have a look at some of the methods commonly employed in the treatment of emotional difficulties. I have not seen the latest figures on the sale of barbiturates, but as I recall those I last saw, it struck me that even in those states where the sale was restricted to patients with physicians' prescriptions, the amount sold was colossal. The only reason sales can reach such proportions is that the symptoms controlled by barbiturates appear so often among the patients you treat.

Among those for whom barbiturates are prescribed is first the patient with insomnia. The one who is tired all day and restless all night almost inevitably comes away from his physician with some barbiturate. The physician knows that the treatment is only symptomatic, but he has done whatever he could to rule out organic pathology, and beyond that he feels that there is nothing left for him to do but to make his patient comfortable. Since most of

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these conditions are chronic—and I refer here particularly to the chronic ones—the physician who prescribes barbiturates to such a patient has started him on a long term program of taking this medication, which as even the labels on bottles indicate, "may be habit-forming." I leave it to others to point out the possible pharmacological effects of continued use of barbiturates. What I am better acquainted with are the clinical effects, and these are such as to give conscientious physicians cause for concern about the widespread use of these drugs. The course is so regular that it can generally be charted in advance. The patient takes the prescribed dose and gets relief. Several weeks later the effectiveness of the original dose has worn off, and he is getting no more sleep with it than he was getting before starting medication. Either on the suggestion of the physician, or without asking for such advice, he keeps increasing the dose, always with the result that the increased dose at first brings relief, only to have it wear off in a shorter or longer period of time. At last he ends up taking as much of the drug as he dares, or as much as his physician will allow him, or as much as he can take without feeling drowsy all the next day. What has happened to his sleep in the meantime? He still sleeps just about as little as he slept before he started taking barbiturates. Then he decides to go to another physician who again puts him through all the clinical tests, which again reveal no organic etiology. When that is over, the patient begins a new course with a different sedative. But he's only on a merry-go-round, —always on the way back to where he started from, and getting very dizzy in the process.

There is one other group of patients treated to a steady diet of barbiturates. They are the ones with persistent anxiety symptoms, either appearing by themselves, or accompanying somatic disorders. They are the patients who are restless, who complain of jitters and cannot relax. They perspire easily, get flushed, have a rapid heartbeat, and maintain a constant attitude of tension. They are the ones who are suspected of hyperthyroidism without having it, the ones who have innumerable gastrointestinal series, without any pathology ever being discovered. They too respond well to barbiturate medication in the early stages, but a steady diet of these drugs results as badly for them as it does for the insomniac, the only difference being that the ill-effects here show a somewhat greater variability. It is evident then that even in the control of superficial symptomatology, continuous use of barbiturates can hardly be justified. If one looks just a little deeper, there is even less excuse for their being used as extensively as they are. The same reasoning applies here as applies to the use of potent analgesics and opiates for the control of pain. Easy resort to these drugs makes physicians too casual and too negligent in their efforts at discovering and correcting the basic pathology. It is known well enough that the premature use of morphine can lead to the neglect and further development of an otherwise-correctible surgical condition. In like manner it behooves the medical practitioner to wonder what it is he is shielding, what he is allowing to develop further, when he starts dosing his patient with barbiturates, which have only the effect of enabling the patient to tolerate a condition which otherwise might be corrected. The patient with an anxiety state who is repeatedly dosed with barbiturates is not being relieved of his anxiety. The outward manifestations are being covered, while the basic tension mounts up, while the etiological factors continue to grow, and while new symptoms develop which will be more damaging and harder to treat. There are, of course, instances in which even the continued use of opiates is justified, those in which the condition is hopeless, and physicians wish to make the patients as comfortable as possible. But we must make sure *before* we resort to this kind of medication that the condition is really hopeless. That, precisely, is what the medical profession has not done in those emotional ills in which sedatives are overused. Not only are many of these conditions less hopeless than they have been considered, but the well-informed and conscientious physician today can treat many of them in his own office, without resort to help by specialists, and without barbiturates.

I do not want to leave the impression that in my opinion there is no legitimate place for the use of barbiturates. There are many instances where the impact of an acute crisis can be materially lessened if the patient's reactivity is diminished by the use of sedatives. There are others in which the artificial induction of several nights' sleep can be of tremendous help in withstanding a physical illness, in living through a crisis, or in gathering strength for the solution of some difficult problem. There is a group of convulsive disorders in which the thoughtful and prolonged use of sedation constitutes the major therapy. But aside from these conditions, the continued use of sedation is something which on its face is suspect, and in the vast majority of instances is bad medicine.

REST CURES

Among the substitutes for sympathetic understanding and effective treatment of emotional ills, one that holds a high priority in today's medical practice is the prescription of rest cures and vacations. Here again I do not want to be too sweeping in my dismissal of such treatment. There are some patients suffering from fatigue in whom a rest and a change can have beneficial results. Clinical observation convinces me, however, that only a very small proportion of patients so treated fall into this group. In too many instances the physician recommends a rest or a vacation because he does not know what else to do, or perhaps because he is projecting his own feeling that he himself could benefit by a rest. The patient with chronic fatigue, who suffers not from overwork but from the ravages of inner conflicts, takes these conflicts with him when he goes on vacation, and he will continue to be as fatigued during and after the vacation as he was before. The patient who suffers the effects of an impossible situation, impossible because of its intrinsic nature or because of his own inability to adjust to it, is going to come back from the vacation to find himself in exactly the same spot he was in before, and his symptoms (whatever they were) will quickly reappear, even if he has benefited temporarily from the vacation. The prescription is worst of all for patients who come to the physician with feelings of helplessness, hopelessness, inadequacy, and frustration. Often such patients are told to get away from it all, to go somewhere where they can have a good time and get a rest. These are the patients who jump out of hotel windows or die from an overdose of sleeping pills taken while away from home. They are the ones whose inner fears cause them to go to a physician looking for support, and instead they are sent off to a strange environment where there is no one to lend them that support. They are often persons in the throes of an early depression, in whom close watch and rapid treatment can make the difference between life and death. But they are sent off to a place where no one sees them, where they are left altogether to their own resources, and where medical help is not quickly available. Even when the ill-effects of a vacation are less traumatic and less drastic, the obligation "to have a good time" when one is not in the mood for it can often be more oppressive and more laborious than going on with one's daily responsibilities.

ELECTROSHOCK

Lest it be thought that as a psychiatrist I take a holier-than-thou attitude toward the rest of the profession without seeing the weaknesses in his own specialty, I should like to point out our own indiscriminate use of some therapeutic techniques. As a matter of fact, we psychiatrists have contributed in no little measure to the misuse of both barbiturates and rest cures. Perhaps we have come along a little in these respects, but there are still enough of us who use these treatments thoughtlessly. However, our major sin of the moment lies in our misuse and overuse of electroshock therapy. It is a form of treatment that is specifically suited to certain conditions, and when restricted to those conditions can be dramatically and lastingly effective. However, the dramatic quality of this treatment, its ease of application, and the fact that it is not time-consuming (and therefore is very profitable)—all contribute toward making it one that is easily abused. There are recurring controversies within psychiatric groups, not so much over the effectiveness of the treatment, but over its legitimate field of application. I am among those who feel that many psychiatrists resort to electroshock treatment too quickly, too frequently, and too exclusively. It is very useful in severe depressions, especially where the threat of suicide makes quick treatment imperative, or where other forms of treatment such as psychotherapy have already proved ineffective. Nonpsychiatric medical practitioners cannot sit as judges in this controversy, but I would advise that in those instances in which one has occasion to refer patients for specialized psychiatric treatment one be cautious about referring them to psychiatrists who make too facile or too general use of this form of treatment.

ACCUSATION AND CONFRONTATION

One "psychiatric technique" too frequently employed is that of accusation and confrontation. Perhaps it is surprising that I list these among frequently used devices in medical practice. I am sure that very few physicians in their own minds place this label on what they do to their patients. But a critical look reveals that the physician who uses this method is no rarity. A patient presents himself to a physician with troublesome and sometimes baffling complaints. The physician investigates the case conscientiously and treats the patient with devotion and care. Then it turns out that the patient's illness is without organic basis, and at this point the physician feels cheated and put upon. He confronts the patient accusingly with a stack of normal roentgenograms and laboratory reports. He tells him there is nothing wrong with him, that he is only imagining his symptoms, that he is a neurotic, and sometimes even that he is a faker. The manner in which this confrontation is carried out varies anywhere from subtle diplomacy to brusque brutality. But even in the former instances the patient understands its meaning oftener than the physician gives him credit for. The patient feels perplexed and resentful about an unfair accusation. It is not his fault that the laboratory tests were normal, and he knows full well that his symptoms are real, that they are not being imagined and certainly not being faked. If he has it on the authority of the physician that such symptoms must be accompanied by positive objective findings, the only conclusion he can draw is that the physician was not skillful enough to locate the pathology, and there is nothing for him to do but go to another physician and subject himself to another series of investigations. On the other hand, a physician who appreciates the potency of psychogenic forces in the causation of somatic symptoms, one who has a sympathetic understanding of the state of mind of the sick and frightened patient, is able to be of tremendous help to his patient and to come off with much more credit to himself. The same set of negative findings can be presented to the patient as something reassuring rather than as a proof of his dishonesty. They can be presented as something perfectly understandable, rather than as something that is baffling and mysterious. The reassurance, accompanied by the physician's understanding of the patient as well as the laboratory reports, can in itself be tremendously helpful. Beyond that, it clears the decks for a consideration of what might be involved when organic pathology was not present.

UNINFORMED PATIENTS

Among those medical practices which must be termed psychologically unsound, one of the most frequent is that of keeping the patient ignorant of the facts of his illness. One result of this practice has been decried by many physicians. It is the habit the American public has developed of seeking medical information from a variety of lay sources, mostly in newspapers and magazines, in which the authors are more interested in the salability of the printed matter than in its salutory effect on the health of the patient. The stirring up of confusions, the whipping up of anxiety, and the mass stampeding to the use of untried drugs are only a few of the undesirable effects. But those in the medical profession who criticize writers for catering to the curiosity of the public should stop first to examine their own role in having created this curiosity. Considering its educational level, the American public is shockingly ignorant about the human body, its anatomy and physiology, its health and its illness. Some portion of the fault for this ignorance rests with the nation's educational institutions, which have convinced themselves that it is more important for a person to know the third declension in Latin than it is for him to know what the stomach is, where it lies, how it works, and what disturbs its workings. But we physicians also carry a large share of the blame. It is everyday practice for physicians to give vague, noncommittal names to the conditions for which they treat their patients and to give treatments without identifying or explaining them. In no other country are patients of equal sophistication and equal educational level treated with so little respect for their curiosity and their understanding. I know of no country in western Europe in which an intelligent and well-read patient will report that he has received a course of injections from his physician, without being able to identify the condition for which he was being treated and the material that was being injected. But that is an everyday experience in this country. It is as though the medical profession had reached the tacit agreement that "the less said the better." From the point of view of one interested in mental health, it must be said that this conspiracy of silence has a most unfortunate effect on the general health level. It creates an atmosphere of mystery and confusion in which the patient is blindly buffeted between fear of the unknown and hope for magic. This cloak of silence with which we physicians surround ourselves has made patients anxious about themselves and distrustful of us. It is little wonder that they gobble up every bit of information which comes their way that might reveal to them some secret which physicians have been trying to hide. All this is the more unfortunate because it is so very unnecessary. The average American physician is so well-trained and so well-informed that he need not be at all ashamed of sharing with his patients his findings, his thinking, and his planning. Such openness with the patient will give the physician a more secure position of trust and respect. What is even more important, it will relieve the patient of that sense of anxiety which all persons feel when they are kept in the dark.

TONSILLECTOMIES IN CHILDREN

The failure of physicians to instruct their patients has been especially pernicious in the performance of tonsillectomies in children, a surgical procedure which is carried out on a very large proportion of the population at an age when the patient is particularly impressionable. Since physicians generally do not share much information with their patients, it is hardly surprising that they share even less with children. They assume that children would not understand anyway, and if they did understand, the information would only make them less tractable. Furthermore, they know that the operation involves very little surgical risk, that the patient is bound to come out without any serious damage. Therefore, they see little reason for arousing his anxiety by discussing the details of the coming operation. Those who measure damage from tonsillectomies in terms of anesthetic deaths or fatal hemorrhage are perfectly right in saying that in competent hands the surgical risk is a minimal one. However, if one considers the damage that tonsillectomies have inflicted on people by traumatizing them emotionally and causing them future states of tension and unhappiness, by making them feel less whole and less able to care for themselves in a hostile world, and by making them less able to derive full benefit from the ministrations of the physician, then one must say that the tonsillectomy looms as a very serious operation. Should the tonsillectomy as an operation be abandoned then? For my part, I should not like to take that responsibility on myself so long as more competent authorities feel that it is advisable to remove the tonsils either as a source of infection or as a mechanical impediment. I say only that if physicians are going to keep on taking out tonsils in the numbers that they have, they ought to be a little more cognizant of what happens to the patient, and much more effective than they have been in the past in minimizing the trauma. To the physician, the tonsillectomy is nothing more than a minor operation in which the two most frequent annoyances are an occasional bleeder or a loudly screaming child.

What is it like to the child himself, i. e., the child who is completely unprepared or who in place of preparation has received some evasion or some lie ("You're going to get an injection." "We're just going for a ride." "The doctor's just going to look at you.")? First of all, the child is taken out of the house hungry and brought to a strange and somewhat fearsome place. Even the adult reacts with apprehension and with a greater readiness for panic when he is hungry. (This is evidenced by our experience in the last war when the badly fed battalion was the one with the greatest number of psychiatric casualties and the one least able to accomplish its combat mission. On the other hand, those groups in which the commanding officers paid special attention to the maintenance of a good hot food supply were able to withstand surprising pressures.) This hungry and therefore apprehensive child is often kept waiting for long periods of time, and he sees and hears things which tend to increase his apprehension. He is then separated from his mother, usually not by his own physician, but by a strange and sometimes masked attendant or nurse. He sees other masked and robed figures, he smells strange smells, is given a painful injection, has a mask put over his mouth and nose, and is forced to breathe something which chokes him. Is it too surprising that to the uninitiated child the most frequent conclusion is that he is being killed, and that all the strange doings are nothing more than an accompanying ritual? He awakens feeling ill and experiencing a soreness in his throat, which convinces him that the attempt on his life somehow involved a stab in the throat. At this point he is usually still among strangers, and it is only when he is fully recovered from the anesthesia that his mother is allowed to see him. By that time he realizes that he has escaped death, but the anxiety which accompanies the miraculous escape stays with him, as do the confusion over why he was subjected to it, and the resentment against those who did it. Does all of this sound very fantastic? These are not my own fantasies. These are experiences recalled by many children soon after the tonsillectomy, and by many more adults in psychiatric treatment recalling traumatic experiences of childhood. So many psychiatrists have obtained such strikingly similar material from so many patients that there can be no doubt about the validity of these reports.

I have said before that I do not expect the medical profession to give up tonsillectomies. I do not expect every child who is going to undergo one to be sent first for a course of treatment by a psychiatrist. Any pediatrician, any general practitioner, any ear, nose, and throat specialist who takes the trouble to think about how a tonsillectomy might affect the child will readily find means to avoid the worst of the possible damage. I stress this example not only because the tonsillectomy is such a frequent procedure, but more because a consideration of what the physician might do for the tonsillectomy patient suggests much of what he can do by way of emotional assistance to patients in other circumstances. This, then, is what the physician might do for a child facing a tonsillectomy:

As a first requirement, I would say that he ought to be honest with the child, and as a corollary to the honesty, he ought to be informative rather than secretive. Depending on the age and the level of understanding of the child, the physician should tell him what is wrong, what the anatomical facts are, what is going to be removed, how it is going to be removed, and what the effects are. I know that when I use the phrase "depending on the level of understanding," many physicians will use this as an escape, because they assume blandly that children understand nothing and, therefore, they need explain nothing. Those of us who work with children realize that they understand much more of the important things than we ever give them credit for. What they fail to understand are not facts and ideas, but rather our complex and garbled terminology. Therefore, it behooves the physician who is not being understood to find simpler and more understandable ways of communicating his information, rather than assuming that the child cannot possibly grasp it. Beyond being honest and informative, the physician should be able to anticipate the major sources of the patient's anxiety. One of these is the aspect of strangeness which accompanies anyone's first surgical experience. If possible, the patient should be introduced to the scene before the actual operation. When he is taken from his mother, it should be by the physician or by a nurse with whom he is acquainted rather than by a total stranger. Even when it is not possible to make him familiar with the operating room in advance, it is at least possible to let him handle and smell an ether mask or, better yet, to let him take it home for a few days, where he can get familiar with it by putting it on himself, on other children, or on dolls. The mother should be with the child to the point where he is anesthetized and immediately on awakening. Even if it may be somewhat of a nuisance to have an anxious mother around, it still serves an important purpose in protecting the child. Although it cannot be avoided that the child be brought to the operation in a hungry state, a more careful attention to scheduling would eliminate the need for his sitting around hungry for many hours while awaiting his turn. By way of anticipating sources of anxiety, the physician should know that the mouth, as one of the early, primary sources of physical gratification, is emotionally very important to the child. The information about what is to be done should be so transmitted as to reassure the child about any possible damage to this primary source of gratification. Also by way of anticipating anxieties, the physician should know that some children will look on the surgical procedure as a punishment for crimes they imagine themselves to have committed (aggressive thoughts, or wishes). Here again, a reassuring, honest attitude will help eliminate such misinterpretations. Above all, the physician should avoid anything that can encourage fear and confusion—as happens in enuretic children, for example, when they are told that the tonsillectomy is going to cure the enuresis. Since they inevitably carry a load of guilt about their enuresis, they look on the operation not as a cure but as a punishment, an attack which will be repeated if the enuresis continues. For many such children, the tonsillectomy becomes a substitute castration.

SUMMARY AND CONCLUSIONS

As I mention ways in which physicians can be helpful with the emotional aspects of their patients' health, it may seem that I am not writing about psychiatric techniques, but rather about common sense, fundamental decency, sensitivity and intuition. Actually, that is all I am writing about, but intuition, decency, and common sense can be vastly more effective when combined with adequate knowledge about the emotional growth, development, and functioning of the human being. The good physician has always been honest with his patients; his honesty can be more meaningfully applied when he knows what security the patient seeks from it and the effect that it can have on the patient's well-being. The physician today must know a great deal about the emotional needs of his patients. He should know the possible consequences when these needs are not satisfied, for without such knowledge he cannot understand many of his patients' illnesses. He should know that when a patient comes to him whom he cannot help with medication and surgery, he may still be able to help him with reassurance, support, sympathetic understanding, and a clearing up of frightening misconceptions. He should know that a competent and sympathetic physician fulfills an urgent need for many patients as a parent-substitute, who serves as the guardian against both physical dangers and emotional terrors threatening their health. When common sense, sensitivity, honesty, and intuition are bolstered by this kind of psychological knowledge, then one can speak of the result as psychiatric techniques. But these are techniques that are available not only to the psychiatric specialist. They are equally available to the nonpsychiatric medical practitioner. The health needs of the population demand that they be adopted as everyday techniques by everyone practicing medicine.

National Association for Mental Health, Inc., 1790 Broadway, New York, N. Y.

Leiomyomas of Stomach.—Leiomyomas of the stomach which are large enough to cause clinical symptoms are not rare and will be encountered occasionally in roentgen studies. Such tumors often give evidence of their presence by gastric bleeding. Unless they produce obstruction, they cause little digestive distress and no cachexia, and often may be found when exploratory operation is done for other conditions. Because many of these tumors of smooth muscle origin may be sarcomatous, they should be removed by resection of the stomach rather than by local excision. If removed cleanly leiomyomas do not recur.—Samuel F. Marshall, M.D., and William A. Meissner, M.D., Leiomyoma of the Stomach, *The Surgical Clinics of North America,* June, 1951.

REFERRING YOUR PATIENT TO A PSYCHIATRIST

John M. Flumerfelt, M.D., Cleveland

A psychiatrist at a medical meeting of this kind would have been unheard of not too many years ago. If he had been present, he would probably have talked about insanity, illustrating his talk with microscopic pictures of brain damage.

Today I am not going to discuss the broader path created by psychiatry since then, nor its increased acceptance as an important functional part of the practice of medicine. The changed status of psychiatriy is abundantly evidenced by the fact that today I am going to consider the problem of referring an adult neurotic person to a psychiatrist—a person who is sane, sensitive, likely to have fears and prejudices related to psychiatry, likely to take offense or even to become alarmed at this suggestion from his physician.

In the last 50 years people have been given an idea that is perturbing and hard to believe: they have been told that man does not know all of his own mind; that many of his thoughts and actions, as well as many of the symptoms he may have, are motivated by psychic forces within himself of which he is unaware. The problem was simpler four centuries ago, when the strange behavior of the mind was thought to be caused by demons who supposedly had taken up residence in the unfortunate sufferer, or half a century ago, when much more scientific beliefs held that each departure from the "normal" was caused by a physical disease process which would reveal itself in an organic pathology if only that could be found. For these and other reasons, the neurotic patient is not likely to take kindly to the suggestion that his troubles are due to unconscious forces acting on his thoughts and emotions; and the physician who is considering referring his patient to a psychiatrist may well be pardoned a modicum of hesitancy or even skepticism. For one thing, would it not be asking a great deal of both physician and patient to ask them to accept such a hypothesis as true just because a small number of people say it is? And for another thing, would it not be natural for them to suspect that such a notion might lend itself to charlatanism and exploitation of unethical, unscientific, or otherwise disreputable varieties? That strange ideas might be put into a person's mind?

To these general objections, which may well form the backbone of resistance to a psychiatric referral, I may add others that are individual.

Persons who are well-informed on other matters may still consider referral to a psychiatrist as evidence of "queerness" or even insanity. Twenty or 30 years ago this was almost literally true.

Or, the patient may attach to the word "neurosis" the connotation that if indeed he is neurotic and if his neurosis is found out, he will be set apart from his fellow men as a weakling, one who lacks will power, and a supine seeker after sympathy at the expense of others.

In addition, there are always less conscious objections on the part of the patient, which are not likely to become apparent until after a psychiatric study has been started. By and large, these objections are made up of feelings of guilt that pertain to equally unconscious and forbidden impulses, and the patient, without knowing why, may feel exceedingly anxious about any probing into his inner self. Although both the patient and the referring physician may not have access to this category of objection, it is inevitably present and can be silently acknowledged by the physician.

Even in the case of patients who are willing and even eager for psychiatric referral, one can be almost certain that some of the objections so far mentioned will be present and will continue to require attention after treatment has been started. The psychiatrist, like his medical colleague, appreciates a clear field for treatment, and any help given by the referring physician which removes even some of the more superficial obstructions makes the referral that much better for the patient as well as for the psychiatrist's efforts.

Another and valid difficulty in the way of referral is that psychiatric treatment of neurosis may take a long time and therefore be very expensive for the patient. So far, there is no happy answer to this objection, in spite of the fact that psychiatrists, like other medical men, devote much of their time gratis to persons who cannot pay for treatment, in spite of social efforts such as those made by the Community Chest, and in spite of generous private assistance such as those in Cleveland have been fortunate to receive. However, it is a fact that psychiatric patients, just because they are human, are likely to work harder to get well if with their own efforts they are able to help pay for treatment. I do not mean to imply for a moment that every patient will become a malingerer if given half a chance. I do mean that the great majority of grown-ups are adult enough to feel better about accepting treatment and to make better use of it if they can pay for it themselves. Therefore, in psychiatry, just as in all medicine, there is the universal and paradoxical problem that has yet to be solved: how to provide necessary medical care without lessening the self-respect of the patient or, at the same time, his respect for the help given him.

With a bona fide neurosis a brief therapy usually carries with it a limitation on the degree of cure effected, despite the continuing efforts of psychiatrists to bring about some solution of the problem. Sometimes, however, a great deal of relief from symptoms may result from only brief treatment, and in certain cases it is wise not to carry treatment further. The point is that the length of time required for psychiatric treatment varies and hence treatment may not always be so expensive as the patient at first fears. Whether the treatment is to take a long or a short time can best be determined by the psychiatrist after he has seen the patients and has had an opportunity to form an opinion.

Read before the Fourth Clinical Session of the American Medical Association, Cleveland, Dec. 6, 1950.

There is a good reason why psychiatric treatment with some patients takes a long time. A neurosis existing in a person's mind may be likened to an extensive mass of scar tissue that hampers the functions of a physical part. Scar tissue, as you know, is rigid and inelastic. It has a tendency to constrict and, in so doing, creates greater dysfunction the older it becomes. Any efforts to eradicate the scar and to check its hindrance of healthy functions are time-consuming and repetitious. Sometimes the physician must settle for a partial improvement. In other cases, with great persistence on his part and the determined cooperation of his patient, he can win through to a full return of function.

In spite of the desire to shorten the time required for psychiatric treatment, there is no push button armamentarium at the disposal of the psychiatrist to enable him to go at once to the center of the problem and to dissolve it. The way is blocked by mental defenses that may take months or even years for the most skilled in treatment to surmount, and any method that by-passes these defenses cannot achieve a cure in the full meaning of the word, even if important symptomatic relief is obtained.

Considering all of the objections mentioned so far, the fact that most patients will accept their physician's recommendation and go to a psychiatrist is in large measure a tribute to their confidence in the physician and to his reasonable explanation of their need for this kind of help. There are some patients, of course, whose wish for psychiatric help is already considerable and whose knowledge and sophistication with regard to such help has brought them past their objections. These patients do not present a problem for referral and need not be further considered in this discussion.

However, many patients need some help from the referring physician. In assessing the problem, the physician should consider, first of all, how much the patient wants relief from his symptoms. Are they painfully distressing to the patient, as, for instance, severe anxiety and phobic symptoms are painful in themselves? Or, does the patient really feel that his functioning in life is so severely handicapped that he urgently desires assistance and will work hard to get well? Or, at least do his family and friends find his present state so intolerable that they put firm and consistent pressure on him to seek treatment? The more the patient's and his friends' attitudes toward his symptoms fulfill these criteria, the better is his chance of accepting a psychiatric referral and of being helped once he has begun treatment.

The referring physician, of course, is very familiar with such criteria because he knows that a patient who suffers pain, or whose functioning is impaired by any illness, already is provided with a motive to seek medical care—a motive far more effective in securing cooperation in treatment than any amount of persuasion or coercion from other sources.

The point of this is—and it may often be overlooked by the referring physician—that the same motivations, generally, are necessary for a successful psychiatric referral and successful treatment. Recently a patient of mine who had been in treatment for several years refreshed all of this for me by volunteering, "If I hadn't been desperate to get free of my condition, I'd never have gone through with this treatment and told you the few things about myself that I knew at the beginning and most that I didn't know until later." It was also true that before starting psychiatric treatment, she had tried many other "cures," including a major operation and an imposing list of medicinal preparations. Her symptoms had made her their prisoner from the time she was 14 years old until after she started treatment at 40 years of age.

My patient's comment, by the way, helps to dispose of two other objections popularly held by people: (1) that psychiatric treatment is a pleasurable recreation for wealthy and indolent women, and (2) that just talking about one's self cannot amount to anything.

If the criteria described are not met by the patient and his family, if he can deny or otherwise elude his anxieties, or if he has someone at home who helps him to escape from facing the facts of his illness, the chances for a successful psychiatric referral are slim. If, in addition, the referring physician or the psychiatrist, after repeated attempts, cannot convince him of the realty of his illness and by that approach produce in him a healthy anxiety to be treated, the chances of a successful outcome are remote.

However, it is possible for the physician to increase his patient's objections to a psychiatric referral. If the physician is apologetic; if he says to the patient, "Now, I've examined you thoroughly and find nothing wrong and I think you'd better see a psychiatrist"; if he says or implies, "There's nothing to it; it's all in your head"; if he reveals by word or act that he is cross and out of patience—then the patient will surely feel that his difficulties are abased and that he is being "kicked out." His reaction will be one of resentment, with a proportionate decline in his chances of being helped.

Finally, the physician, however much he may want to avoid arousing the patient's prejudices, should always tell him that the doctor to whom he is being referred is a psychiatrist. Otherwise the patient will feel deceived and his confidence in the new treatment may be destroyed. The psychiatrist himself cannot carry on such a hoax, and for at least one very good reason: if he expects the patient to be honest with him, he must be no less honest with the patient.

In preparing the patient for psychiatric referral, the physician should, first of all, do what he would naturally do—take a history and make an adequate physical examination. If these point to a psychological disturbance, he can ask the patient to tell more about himself, explaining to the patient that the symptoms from which he suffers suggest there may be things in his life which are bothering him. It is better to avoid the leading question. For instance, instead of asking directly, "Is your marriage a happy one?" the physician might say, "Can you tell me a little more about your marriage?" In this way the physician can imply that what has been told so far is not enough to explain the symptoms, thereby putting a firm but gentle pressure on the patient to reveal more and more until the general nature, at least, of the problem is clear enough to be understood.

However, an otherwise astute physician will sometimes make the mistake of taking too quick an approach to a touchy problem which is obvious to him but not to the patient. If the first question has revealed a serious marital problem, the best tactic is to ask the patient casually whether he thinks there might be a difficulty of this kind. The physician should accept a quick and vigorous denial instead of immediately confronting the patient with all the evidence contrary to the patient's opinion. Unless the physician desists for the time being at this point, he may so alarm the patient that later efforts by himself (or by the psychiatrist) may be of no avail. Subsequetly the physician may return to the topic and find the patient ready to admit the problem, the bond of confidence presumably having grown stronger.

If subsequent attempts fail, however, the physician may elect to show the patient by way of everyday examples, and without touching on the serious problem observed, how emotions can produce changes in the body's functions. The purpose of such an approach is to give the patient some intellectual conviction about his need for psychiatric treatment, and it may succeed at least to the point where the patient is willing to "try out" a psychiatrist. Indeed, a "try-it-and-see" approach often makes it easier for the patient to get under way.

Sooner or later the patient will interpose some of the objections I have been considering, and his physician should encourage him to tell exactly how he feels about going to a psychiatrist so that factual explanations may be offered in an attempt to undo fear and prejudice. A discussion of this kind may need to be repeated more than once, and the physician should not relinquish his goal of referral simply because the first time he broaches the subject to the patient, he meets with a tenuous or even a flat rejection. Time, patience, and reasonable persistence will eventually succeed with many patients, whose distressing symptoms will also influence them to seek relief.

There are some patients, however, who are so afraid of psychiatry or so prejudiced against it that referral becomes impossible. Whether a patient will eventually accept psychiatric referral can be determined only after reasonable efforts have been made to persuade him. It is better for the physician to desist than to threaten the patient or to force him to go to a psychiatrist against his will—an imposition resented by any adult and one that inevitably boomerangs against successful treatment.

Whether the patient eventually accepts psychiatric referral or not, the physician should be firm about maintaining the need for this kind of help from the time he first recommends that the patient see a psychiatrist until efforts at referral have either succeeded or failed. If, instead, the physician goes against his better judgment and gives in to the patient's demands for further studies or other kinds of therapy, his position is so weakened by the patient's knowledge of his wavering attitude that failure will probably result. The physician is aware, often enough, of the patient's desire to have a physical instead of an emotional cause for his symptoms. Moreover, it is understandable that the physician, not wanting to anger or to alarm his patient, may be tempted to follow a course that avoids the issue; but such a policy is inevitably a shortsighted one. If the physician gives in to the patient and repeats physical measures, even though he does so against his better judgment, he may incur the responsibility of helping to "fix" the patient's neurosis so that psychiatric treatment becomes more difficult or even impossible.

Sometimes the physician may reason that if the patient refuses psychiatric referral and that if he (the physician) does not "do something," the patient may resort to quacks and nostrums, which could do more harm than good. Such an argument has, of course, a realistic side. The physician may rightly point out that a policy of expediency is under his control and that he will at least avoid doing things that are harmful to the patient. However, in deciding upon such a policy, he should take into account the risks already mentioned, plus the fact that most patients who are made obdurate by their fears or prejudices are likely to be unreasonable and difficult to manage in other respects. All too often the physician comes to regret such a policy as he finds himself tiring of the never-ending demands made on him by the patient or hoping that the patient will stay away for a while or perhaps stop coming altogether. Physicians who have had this experience are likely to say, "I don't see how you fellows stand it; it would drive me crazy to be a psychiatrist." Patients are quick to sense their physician's attitude toward them, and when they sense that it is an adverse one, they may more or less consciously punish the physician by increasing their demands on him or by going to someone else. Because the patient is not qualified to assess professional skill, the next person whom he consults may be someone unfamiliar with medical ethics.

In conclusion, it is apparent that this discussion has not touched on the problem of what the physician can do himself in the way of psychotherapy when no psychiatrist or psychiatric clinic is available, or when other circumstances make a psychiatric referral impossible. That is a topic about which much has been written and taught that is good—and much, too, that is sometimes confusing. However, the fact is that psychotherapy has already started when a patient comes to his physician for help, and when the physician has decided that a psychiatric referral is indicated and so advises him.

University Hospitals.

Background of U. S. Scientists.—A statistical analysis that took some five years produced several significant surprises. . . . The first surprise is that small liberal arts colleges are far and away the most productive sources of future scientists among U. S. institutions. Of the 50 leading institutions in this respect (i. e., those that turn out the largest proportion of graduates who become scientists), 39 are small liberal arts colleges. Only three large universities appear on this list of leaders, and only two technological institutions; the others among the 50 are three state agricultural schools and three small universities that lean toward technology. . . . The second striking fact, which may surprise some, is that the institutions which lead in the production of scientists are mainly concentrated in the Middle West. That this region is particularly productive of scientists is confirmed by a study of all the 500 institutions for which indexes were computed. In that ranking the Middle West and the Pacific coast lead the nation, with the Middle Atlantic States and New England next and the South last. . . . In the production of graduates entering some other professions, such as the law, the ranking is quite different. According to a survey made before World War II, the U. S. Northeast is the region most productive of future lawyers.—H. B. Goodrich, R. H. Knapp, and G. A. W. Boehm, the Origins of U. S. Scientists, *Scientific American,* July, 1951.

CLINICAL NOTES

TREATMENT OF SHOCK WITH ARTERENOL

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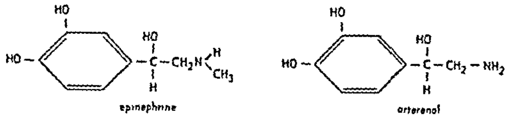
The recent advances in the understanding of the mechanism of shock and its treatment have improved the prognosis of patients in this condition. Nevertheless, the treatment leaves much to be desired. Recent contributions to the study of irreversible shock, as well as clinical experience, have demonstrated that currently available therapy (i. e., various forms of fluid replacement) may be fruitless in advanced or prolonged shock.

The investigations by Goldenberg and his associates [1] of the action of arterenol (nor-epinephrine) demonstrated that this compound increased the blood pressure very markedly by increasing peripheral resistance, without the other effects of epinephrine. Arterenol is related to epinephrine as indicated in the structural formulas. It was thought, therefore, that it might be of some value in the treatment of shock.



Structural formulas of epinephrine and arterenol.

We have recently had the opportunity to observe the action of arterenol in a patient in profound, prolonged shock from a perforated gastric ulcer. The results were sufficiently dramatic to warrant their being reported.

REPORT OF A CASE

A 73 year old white man was admitted to the hospital on Feb. 9, 1950, complaining of indefinite midepigastric pain. According to his history, substernal burning associated with retching had developed four days prior to admission; this gradually disappeared and 24 hours before admission was replaced by a sharp midepigastric pain, which persisted until the patient was admitted to the hospital. Past history was essentially negative for gastrointestinal or cardiovascular symptoms.

Physical examination revealed an elderly white man without obtainable pulse or blood pressure, whose skin was cold, clammy and cyanotic. The lung fields were clear. The heart sounds were poorly audible. The abdomen was distended and tympanitic and apparently contained fluid. There was no spasm, nor was there any audible peristalsis. Roentgenograms of the abdomen revealed intraperitoneal air and fluid. The results of blood studies revealed 14,800 white blood cells, with 80 per cent neutrophils (8 per cent band forms), 6,100,000 red blood cells and a hematocrit value of 58%. The electrocardiogram was interpreted as disclosing only sinus tachycardia and frequent ventricular extrasystoles.

Therapy utilizing nasal oxygen, 500 cc. of whole blood, 500 cc. of plasma, 1,000 cc. of 5 per cent dextrose in saline and 250 cc. of 5 per cent dextrose in distilled water was instituted, but after three hours the pulse rate and blood pressure were still not obtainable and the patient's condition had not noticeably improved.

An infusion of arterenol (2 mg. per liter) was begun at the rate of 100 drops a minute, and two minutes later the patient's pulse was strong and his blood pressure, obtained for the first time, was 140/90. It reached 170/110 seven minutes after the start of the infusion, at which time the patient complained of a headache. The infusion was then slowed to 35 drops a minute, and the blood pressure dropped to 130/80, with relief of the headache. It was maintained at this level by variation of the rate of inflow according to the change in blood pressure.

The patient was observed for an additional four hours, during which time his general condition improved so that laparotomy became possible. A perforation found on the anterior surface of the lesser curvature of the stomach was closed. Two thousand cubic centimeters of yellow serous material (culture of which yielded Streptococcus viridans) and a large amount of air was evacuated from the peritoneal cavity. During the operative procedure the patient received an additional 500 cc. of whole blood, 500 cc. of plasma and 1,000 cc. of 5 per cent dextrose in saline. The use of the arterenol solution, which was administered throughout the operation, was discontinued at the completion of the operative procedure. The patient's blood pressure promptly fell and remained unobtainable for seven minutes, with the pulse becoming weaker. Resuming the arterenol infusion caused a prompt rise of the blood pressure. Four hours postoperatively, with arterenol still being infused at the rate of 30 drops a minute, the blood pressure was 122/78 and the skin was warm. Ten hours postoperatively the infusion was stopped, and again the blood pressure fell abruptly and became unobtainable, but on reinstitution of therapy with arterenol infusion it rose promptly to measurable levels. The infusion was continued at about the same rate for a period of 32 hours postoperatively (38 hours after institution of therapy) and was then discontinued. The patient's blood pressure fell from 138/90 to 90/60 within three to four minutes, and his skin became somewhat cool and moist. The blood pressure stabilized at this level, then gradually rose to 110/70 within an hour and remained at normal levels thereafter. During the first two postoperative days, the patient was maintained in fluid balance with plasma, blood, saline and Ringer's solution. Blood chloride levels were normal throughout the postoperative period and the hematocrit reading declined gradually from 58 preoperatively to 52 in 24 hours and then to normal values in 72 hours postoperatively. The patient has had a satisfactory recovery from his perforation and laparotomy.

COMMENT

Several problems confronted us in this case. The patient was seen by members of the medical and surgical services, and there was general agreement as to the hopeless prognosis because of the patient's age (73 years), the time elapsed since perforation (over 24 hours) and the profound state of shock. McElhinney and Holzer [2] report 100 per cent mortality in 11 patients who had perforation over 12 hours and systolic pressures under 100 mm. of mercury on admission. Only five of these 11 patients were able to undergo operation, and, as noted, all died. Similar experiences have been reported from other clinics.[3] The patient's condition was such that surgical intervention was impossible, and his situation seemed hopeless. The first result of the treatment was, however, an immediate and sustained improvement in the general condition so that laparotomy could be performed.

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Sponsored by the Veterans Administration and published with the approval of the Chief Medical Director. The opinions and views set forth in this article are those of the writers and are not necessarily to be considered as reflecting the policies of the Veterans Administration.

The Department of Medical Research of Winthrop-Stearns, Inc., supplied the arterenol used in this work.

[1] Goldenberg, M.; Pines, K. L.; Baldwin, E. de F.; Greene, D. G., and Roh, C. E.: Hemodynamic Response of Man to Nor-Epinephrine and Epinephrine and Its Relation to Problem of Hypertension, Am. J. Med. 5:792 (Dec.) 1948.

[2] McElhinney, W. T., and Holzer, C. E., Jr.: Factors Influencing Mortality from Acute Perforated Peptic Ulcers, Surg., Gynec. & Obst. 87:85 (July) 1948.

[3] DeBakey, M.: Acute Perforated Gastroduodenal Ulceration: Statistical Analysis and Review of Literature, Surgery 8:852 (Nov.) 1940.

The dosage of arterenol administered was calculated roughly on the basis of 0.2 micrograms per kilogram of body weight a minute, as suggested by Goldenberg,[1] and it was administered by constant intravenous drip. The concentration of solution was 2 mg. per liter or 2 micrograms per cubic centimeter. The dosage administered was only approximate, since our infusion set was not calibrated. We measured the number of drops given per minute and regulated the dose by regulating the rate of infusion, being guided by the level of arterial pressure.

Occasionally it was necessary to increase the rate of flow because of a spontaneous drop in tension. It should be noted that when the infusion was stopped on two occasions, the blood pressure dropped rapidly to unobtainable levels. This observation confirms that of others,[4] that the action of arterenol is very short-lived and that this fact is in part responsible for the ease with which its effect can be controlled.

During these changes in blood pressure, the pulse rate remained fairly constant. While this is contrary to previous observations, our patient was in a complicated physiological state not comparable to that in the subjects previously studied by others. The constancy of the pulse rate of between 120 and 130 beats a minute, whether or not the patient appeared to be in shock, was one of our guiding signs as to his true state. The fall of the pulse rate to 100 suggested that improvement was taking place and accordingly that it would be safe to discontinue the infusion. This proved to be correct.

Throughout the operation and for 32 hours thereafter, it was possible to maintain the patient's blood pressure at normal levels until there was reversal of whatever vasodepressor mechanisms were active during the period of shock. It is important that so long as the blood pressure was maintained at normal levels this man did not have any of the symptoms usually associated with shock. It should also be noted that within the first 24 hours after operation sufficient return of spontaneous vasomotor tone had not occurred to permit cessation of the medication. After 38 hours, when the pulse rate had slowed to 100, it was possible to stop the infusion. Apparently then, arterenol does provide vasomotor tone in the shock patient and does not prevent the repair of the normal vasomotor mechanisms following shock.

Goldenberg [1] has noted that after the intravenous injection of arterenol there is an elevation of the blood pressure, systolic and diastolic, with an over-all increase in peripheral resistance. Concurrent with these changes, there is a slowing of the pulse rate. The cardiac output is not significantly increased.

In shock, during the early phases, there is an over-all increase in vascular tonus, which becomes progressively impaired until in the last, or irreversible, phase there is a loss of small vessel tone and pooling of blood in these channels.[5] Under these conditions, the administration of arterenol may be a rational therapy for shock. Accordingly, Goldenberg,[4b] *in* a preliminary report, has cited the use of this compound in the hypotension that occasionally occurs after thoracolumbar sympathectomy and also in two cases of hemorrhagic shock, with good results.

From our single experience, it appears that this compound may well turn out to be extremely useful in shock. Its action is prompt, predictable and easily controlled. Its value in various clinical types of shock is currently under investigation.

A word of caution is necessary. Because of the prompt response to arterenol, the cause of the shock must be ascertained prior to treatment. Under arterenol therapy, a concealed hemorrhage would continue unchecked and might be aggravated by the drug.

SUMMARY

A patient with perforated peptic ulcer, who was inoperable because of profound shock, was treated with arterenol (nor-epinephrine). The shock state was rapidly relieved by this drug so that laparotomy and repair became possible. This compound has a marked but easily controllable pressor effect, which proved, in this case, to be lifesaving. It seems a powerful addition to therapy.

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[4] (*a*) Goldenberg and others.[1] (*b*) Goldenberg, M.; Apgar, V.; Deterling, R. A., Jr., and Pines, K. L.: Nor-Epinephrine (Arterenol, Sympathin N) as Pressor Drug, J. A. M. A. **14**: 776 (July 2) 1949.

[5] Zweifach, B. W.; Chambers, R.; Lee, R. E., and Hyman, C.: Reactions of Peripheral Blood Vessels in Experimental Hemorrhage, Ann. New York Acad. Sc. **49**: 553 (May 11) 1948.

EVALUATION OF CLINICAL METHODS IN GASTROINTESTINAL DISEASE

LIVER FUNCTION TESTS IN PEPTIC ULCER

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There has been increasing mention in the literature of the occurrence of liver damage in peptic ulcer, as shown experimentally,[1] pathologically,[2] and clinically by biopsy [3] and liver-function tests.[4] This important question of the frequency of occurrence of liver damage in peptic ulcer concerns all of us not only from the diagnostic but also from the therapeutic and preventive points of view. It particularly concerns my co-authors and me in our investigation [5] of a modern routine for

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[1] Reymont, A.: A Study of Liver Function in Experimental "Peptic Ulcer," Am. J. Digest. Dis. **7**: 65, 1940. Gandy, C., cited by Jergesen, F. H., and Simonds, S. P.: Blood Lipase in Patients with Peptic Ulcer, J. Lab. & Clin. Med. **19**: 1054, 1934.

[2] (*a*) Jergesen, F. H., and Simonds, S. P.: Blood Lipase in Patients with Peptic Ulcer, J. Lab & Clin. *Med.* **19**: 1054, 1934. (*b*) Gordon, J. S., Jr., and Manning, J. J.: Autopsy *Survey of Gastro*-Duodenal Ulcers in Philadelphia General Hospital 1920-1937, Am. J. M. Sc. **202**: 423, 1941. (c) Vilardell, J., and Llort, M. C.: *Estudio* histológico del hígado (por biopsia) en las colecistitis y ulcus gastroduodenal, Rev. *méd.* Barcelona **17**: 325, 1932.

[3] (*a*) Schnitker, M. A., and Hass, G. M.: Histologic Study of Liver *in* Patients Affected with *Peptic Ulcer, Am. J.* Digest. Dis. **1**: 537, 1934. (*b*) Mateer, J. G.; Hartman, *F. W.; Blatz, J. I.*; Fallis, L. D.; McGraw, A. B., and Steele, H. H.: Combined Liver Biopsy and Liver Function Study in 132 Cases of Cholelithiasis and 31 Cases of Peptic Ulcer (Operated Cases), Gastroenterology **11**: 284, 1948. (*c*) Berg, B. N., and Jobling, J. W.: Biliary and Hepatic Factors in Peptic Ulcer, Arch. Surg. **20**: 997 (June) 1930.

the complete study of a patient with gastrointestinal disease. If liver damage is a frequent accompaniment of peptic ulcer, liver function studies and perhaps even liver biopsies should be included in the routine study of peptic ulcer cases.

To help determine just how important a role liver damage plays in peptic ulcer, we reviewed the last 70 consecutive cases of peptic ulcer on the medical wards of Beth Israel and Metropolitan Hospitals, New York City.

The clinical diagnosis of peptic ulcer was confirmed in each case by an X-ray showing a deformed duodenum. The study of liver function in most patients included icteric indexes, cephalin-cholesterol flocculation, thymol turbidity, sulfobromophthalein (bromsulphalein®) sodium tests, cholesterol and cholesterol ester determinations, proteins, and albumin-globulin ratios. An icteric index above 7 was considered abnormal, as were a cephalin-cholesterol flocculation of 3 + or higher in 48 hr.; thymal turbidity above 3.5 units; a total cholesterol level of above 250, a cholesterol ester ratio below 0.50; a total protein value below 5.2 gm. and an albumin-globulin ratio below 1.3:1. The results of the tests of the 70 peptic ulcer patients can be briefly summarized as follows:

The icteric index averaged 3.8. It was above the normal limit of 7 in only two cases. One of these patients, although considered clinically to have an uncomplicated peptic ulcer, was shown at operation to have an obstructive lesion penetrating into the pancreas. The mild degree of icterus (8.3) present was probably connected with this complication. The other patient had gallstones as well as duodenal and gastric ulcers. The elevated icteric index (8.1) and elevated cholesterol (257) were more likely due to the cholelithiasis and gall bladder disturbances than to the ulcers.

The cephalin-cholesterol flocculation tests averaged 1 + to 2 + and were abnormal in only six cases. The ulcer was complicated in five of these. The cephalin-cholesterol flocculation test was elevated (3 +) in only one patient with uncomplicated peptic ulcer.

The thymol turbidity tests averaged 2.0 units. It was above the normal limit of 3.5 units in three cases. In only one of these cases was the peptic ulcer uncomplicated.

The sulfobromophthalein tests, total cholesterol, cholesterol esters, total proteins, and albumin and globulin ratios were essentially normal in every case.

Rafsky and others [4i] found hypoproteinemia in 21 of their 50 peptic ulcer cases. They considered the total serum proteins below 6.0 gm. as abnormal. Their results would be much closer to ours if they accepted our figure of 5.3 gm. as the lower limit of normal.

The results of our tests show little or no impairment of liver function in peptic ulcer, whether the test be for the excretory, metabolic or inflammatory functions. This is in direct contrast to the investigations of Mateer and others,[3b] who frequently found liver damage in peptic ulcer patients, especially when pathological studies (punch biopsy) supplemented the liver-function tests. Mateer's 31 cases were all operative, and the changes seen by liver biopsy at operation may have been due to anoxia of the anesthesia, as is suggested by the studies of liver damage in shock and anoxia that Gillman and Gillman [6] report on.

It is also important to differentiate the noncomplicated peptic ulcer cases of our medical practice from the complicated surgical cases that Mateer reported. By "complicated" is meant a chronic ulcer that may have penetrated or formed adhesions to the surrounding organs, or may have produced secondary involvement of other organs such as the gall bladder. In such circumstances one realizes that the liver may readily be affected by ascending infection or secondary inflammatory change. Also, in a case of stenosing peptic ulcer such secondary hepatic inflammatory changes may result. In a case of simple, uncomplicated peptic ulcer there is much less liklihood of concomitant or resultant liver damage.

SUMMARY AND CONCLUSIONS

Some observers have encountered liver changes in cases of peptic ulcer. However no distinction was made between complicated and uncomplicated peptic ulcer.

Chronic peptic ulcers of the complicated type may occasionally produce secondary effects upon the liver, but simple noncomplicated peptic ulcers generally will produce no change upon the liver, as shown by liver function tests.

Liver function tests are not essential to the complete routine study of peptic ulcer cases.

Two E. 95th St.

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4. (*a*) Gordon and Manning.[2b] Berg and Jobling.[3c] (*b*) Kalk, H.: Das Geschwür des Magens und Zwölffingerdarmes und das Geschwür des operierten Magens, Berlin, Urban & Schwarzenberg, 1931. (*c*) Sjöström, P.: Der Citratgehalt im Blutserum als Diagnosticum bei Krankheiten der Leber und der Gallenwege: Eine methodologische, tierexperimentelle und klinische Studie, Acta chir. scandinav, supp. 49, p. 1, 1937. (*d*) Marino, S., and Saladino, A.: La polipeptidemia nei portatori di ulcera gastroduodenale, Arch. farmacol. sper. **63:** 161, 1937. (*e*) Ask-Upmark, E.: Further Observations on Pathogenesis of Peptic Ulcer, Acta med. Scandinav. **103:** 280, 1940. On Presence of Deficiency Factor in Pathogenesis of Peptic Ulcer, Acta chir. scandinav. **84:** 55, 1940. (*f*) Meranze, D. R.; Likoff, W. B., and Schneeberg, N. G.: Blood Galactose Tolerance Test, J. Clin. Path. **12:** 216, 1942. (*g*) Morrison, L. M.: Liver Dysfunction in Peptic Ulcer, Rev. Gastroenterol. **9:** 448, 1942. (*h*) Pollak, H.: Hepatic Dysfunction in Peptic Ulcer: Observations with the Hippuric-Acid Test, Lancet **2:** 131, 1947. (*i*) Rafsky, H. A.; Krieger, C. I., and Honig, L. J.: Protein Studies in Peptic Ulcer, Gastroenterology **16:** 358, 1950.

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6. Gillman, J., and Gillman, T.: Anoxia and the Liver with Special Reference to Shock and Chronic Malnutrition, Am. J. Digest. Dis. **16:** 348, 1949.

TOXIC REACTIONS TO MERALLURIDE INJECTION (MERCUHYDRIN® SODIUM SOLUTION)

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A wide variety of toxic reactions following the use of mercurial diuretics has been reported. Although most of these reactions have been of a mild nature and have occurred infrequently in relation to the widespread use

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of mercurial diuretics, a number of fatal reactions are now well documented. With the introduction of locally less irritating preparations, the intramuscular route of administration has proved to be less toxic. Meralluride injection (mercuhydrin® sodium solution) is one such preparation in wide clinical use. Reports of nine cases of untoward reactions to meralluride injection were found in the literature. These included one case of acute dehydration,[1] three fatal cases of toxic nephrosis,[2] and five cases with reactions of an allergic nature.[3]

The following case is reported as another instance of severe hypersensitivity to meralluride injection, with subsequent successful use of mercaptomerin (thiomerin®) sodium.

REPORT OF A CASE

A 53 year old white male auditor was admitted to Winter Veterans Administration Hospital because of marked pulmonary congestion and mild peripheral edema due to long standing hypertensive cardiovascular disease. His blood pressure on admission was 156 mm. systolic and 110 mm. diastolic. Admission blood counts were normal, but the corrected sedimentation rate (Wintrobe method) was elevated to 24 mm. per hour. Repeated urinalyses were normal, and concentrations to specific gravity 1.030 were reached on routine specimens. Nonprotein nitrogen was 40 mg. per 100 cc. An electrocardiogram revealed left bundle branch block.

The patient was placed on strict bed rest and a low salt diet. His digitalis dosage was increased, and he was given intramuscular injections of 2 cc. of meralluride daily at 9:00 a. m. The edema improved. After the eleventh meralluride injection, the patient complained of vague retrosternal pain, and his temperature rose to 100.6 F. by 4:00 p. m. and 101.6 F. at 8:00 p. m. The following morning he was afebrile and asymptomatic. His twelfth injection was given at the usual time. A sudden severe shaking chill began at 3:30 p. m., followed by fever to 103 F. Again the following morning he was afebrile but complained of weakness and aching in the thigh muscles. The leukocyte count that morning was 5,300, with a normal differential count. The urine was normal and the nonprotein nitrogen 47 mg. per 100 cc. He received no meralluride injection that day and remained afebrile. The next day, his fourteenth in the hospital, he received 1 cc. of meralluride intramuscularly at 9:00 a. m. Within one hour he complained of intense burning of the palms and subungual regions of the fingers. Generalized aching in the back, thighs and legs followed. By 1:00 p. m. he was in another shaking chill, and at 4:00 p. m. his temperature was 103.8 F., his pulse rate 104, and his blood pressure 98 mm. systolic and 70 mm. diastolic. He appeared cyanotic and was very apprehensive. Morphine and oxygen were administered. The temperature returned to normal by the following noon, and only weakness remained. Urinalysis this day showed 1 + albumin and 1 to 3 hyaline casts per high power field in the centrifuged sediment. Subsequent urinalyses were normal. The patient made a gradual recovery, complicated by pulmonary infarction on the twenty-fifth hospital day, and was discharged after 88 days. No further meralluride injection was given.

He was readmitted four and one-half months later, again in moderate pulmonary congestion and minimal peripheral edema. Along with his previous nonmercurial therapy, a trial dose of 0.1 cc. of mercaptomerin sodium was administered subcutaneously without reaction. Then 1 cc. of mercaptomerin sodium was given subcutaneously daily for a week with no ill effects. Again the edema improved.

COMMENT

In this case, as in several others recorded in the literature, premonitory symptoms of a milder nature after injection of the mercurial diuretic were present prior to the severe reaction and recognition of the hypersensitivity. Earlier recognition hinges on one's keeping in mind the possibility of hypersensitivity to mercurial diuretics when dealing with unexpected febrile reactions in patients receiving such diuretics. This patient's first two reactions posed a diagnostic problem—pneumonia, pulmonary embolism, and myocardial infarction being considered.

SUMMARY

A patient displaying severe toxic reactions to meralluride injection did not display similar reactions to mercaptomerin sodium.

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[1] Rechtschaffen, J. S., and Gittler, R. D.: Acute Dehydration Due to a Mercurial Diuretic, J. A. M. A. **144**:237 (Sept. 16) 1950.

[2] (*a*) Bruno, M. S.: Fatal Toxic Nephrosis Following the Administration of Mercurial Diuretics, New England J. Med. **239**:769 (Nov. 18) 1948. (*b*) Wallner, A., and Herman, L.: Mercurial Diuretics: Some Hazards of Mercuhydrin, Ann. Int. Med. **32**:1190 (June) 1950. (*c*) Greenberg, D., and Feibush, J. S.: Toxic Nephrosis from Organic Mercurial Diuretics, New York State J. Med. **49**:2319 (Oct. 1) 1949.

[3] Wallner and Herman.[2b] Modell, W.; Gold, H., and Clarke, D. A.: Quantitative Observations of Mercuhydrin and Mercupurin, J. Pharmacol. & Exper. Therap. **84**:284 (July) 1945. Gelfand, M. L.: Hypersensitivity to Mercuhydrin with Positive Skin Test, Abstracts, J. Allergy **20**:77 (Jan.) 1949. Fineman, A. H., and Rosenberg, S. J.: Mercuhydrin Sensitivity: Report of a Case, Ann. Allergy **8**:80 (Jan-Feb.) 1950. Shatan, H.: The Toxicity of Mercurial Diuretics, Treat. Serv. Bull. **5**:194 (April) 1950.

UREMIA COMPLICATING LEUKEMIA CHEMOTHERAPY

REPORT OF A CASE TREATED WITH TRIETHYLENE MELAMINE

Sheldon C. Kravitz, M.D., Henry D. Diamond, M.D.
and
Lloyd F. Craver, M.D., New York

The increase in endogenous uric acid production in leukemic patients has long been a fact of considerable interest. The combination of even further production of endogenous uric acid induced by therapy and renal insufficiency is one which has been observed to lead to serious and, at times, fatal complications.[1] With newer chemotherapeutic agents in use for the treatment of the lymphomas and leukemias, drugs which are capable of depressing the white blood cell count more rapidly than x-rays, there is need for increased awareness of the possibility of uric acid obstruction of the urinary tract with subsequent uremia. We believe the following to be a case in point.

REPORT OF A CASE

C. M., a white woman aged 54, was first seen in the Diagnostic Clinic of Memorial Hospital on May 17, 1949. She gave a history of abdominal pain and progressive weight loss of one and one-half years' duration. In February, 1948, she had been hospitalized elsewhere and was found to have hepatosplenomegaly, marked leukocytosis, and anemia. A diagnosis of chronic myelogenous leukemia was made, and the patient was subsequently treated with blood transfusions, a short trial of urethan, and, finally, x-ray treatments to the spleen. Because of progression of her symptoms, she was referred to Memorial Hospital, where the diagnosis was confirmed. An incidental finding on rectal examination was a rectal polyp which was examined histopathologically and proved to be adenocarcinoma of the rectum, grade II. This was first treated with high voltage x-rays. Following this, the leukemia was treated with x-rays to the spleen, and the patient was improved sufficiently to permit an operation for the rectal

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From the Medical Neoplasia Service of the Memorial Center for Cancer and Allied Diseases.

[1] Merrill, D.: Uremia Following X-Ray Therapy in Leukemia, New England J. Med. **222**:94, 1940. Lear, H., and Oppenheimer, G. D.: Anuria Following Radiation Therapy in Leukemia, J. A. M. A. **143**: 806 (July 1) 1950.

cancer. On July 2, 1949, an anterior resection of the rectum was carried out by Dr. Lucille Loseke, assistant attending surgeon on the Rectal Service of Memorial Hospital, and a primary end-to-end anastomosis of the large bowel was performed. The patient was discharged in relatively good condition on Aug. 20, 1949, one month postoperatively.

In the outpatient department she required x-ray treatments to the spleen on two separate occasions. But in May, 1950, the liver and spleen became tremendously enlarged, and this was associated with loss of appetite, chills and fever. Readmitted to Memorial Hospital on May 20, 1950, the patient appeared chronically and severely ill. Her spleen filled the entire left side of her abdomen, extending down to the inguinal ligament and reaching 3 cm. to the right of the umbilicus. Her liver was palpable 6 cm. below the right costal margin. Her hemoglobin value was 8.6 gm., red blood cell count 3,100,000 per cubic millimeter, white blood cell count 132,000 per cubic millimeter, and platelets 99,000 per cubic millimeter. Her bone marrow revealed the typical picture of chronic myelogenous leukemia with depressed erythroid activity. Urinalysis was essentially unremarkable. Blood urea nitrogen was 14 mg. per 100 cc.

The patient was given 1000 cc. of packed red blood cells which brought her hemoglobin value up to 11.3 gm. On four successive days, from May 28 to May 31, she was given 5 mg. of triethylene melamine (TEM) by oral administration (fig. 1). On the third day of therapy the patient began to complain of lower abdominal cramps, bladder urgency, dysuria, and oliguria. Her temperature was elevated to 102 F. Her white blood cell count fell precipitously from the pretreatment level of 170,000 to 35,800 per cubic millimeter five days after the first dose of triethylene melamine. The patient was catheterized and found to have hematuria and uric acid crystalluria. Intravenous pylograms showed no concentration of dye on either side. On June 2, 1950, the patient was examined by cystoscope and "sand" was seen exuding from the right ureteral orifice. A catheter could not be passed up the right ureter. One was passed up the left ureter and a retrograde pyelogram revealed a hydronephrotic left kidney. Blood urea nitrogen drawn the following day was found to be 140 mg. per 100 cc. and the serum uric acid was 26 mg. per 100 cc. Despite intravenous administration of fluids and alkalinizing solutions, oliguria and azotemia persisted. On June 6, 1950, the patient was again examined by cystocope and the uric acid crystals could be seen to swirl as distilled water was flushed into the bladder. This time it was possible to catheterize both ureters and the catheters were left indwelling. (The cystoscopies were performed by Drs. Willet Whitmore and Carl Schmidlapp, assistant attending surgeons on the Urological Service.) This was attended by a good diuresis, and in 11 days, during which time fluids were forced and the urine kept alkaline by oral administration of sodium bicarbonate, the patient came out of uremia. Her blood urea nitrogen fell to 19 mg. per 100 cc. and her serum uric acid to 6.3 mg. per 100 cc. Despite the fact that she received no more triethylene melamine, her white blood cell count continued to fall progressively until it reached 5,400 per cubic millimeter. The fall in the white blood cell count was associated with a profound decrease in the size of the spleen to 10 cm. below the left costal margin from the previously described dimensions. After the recovery from her uremia, the patient improved symptomatically and was discharged on June 23, 1950, with a hemoglobin value of 13.5 gm., white blood cell count of 12,000 per cubic millimeter, blood urea nitrogen of 9 mg. per 100 cc., and a serum uric acid of 4.9 mg. per 100 cc. Her spleen was at the level of the umbilicus. Her urinary output was satisfactory.

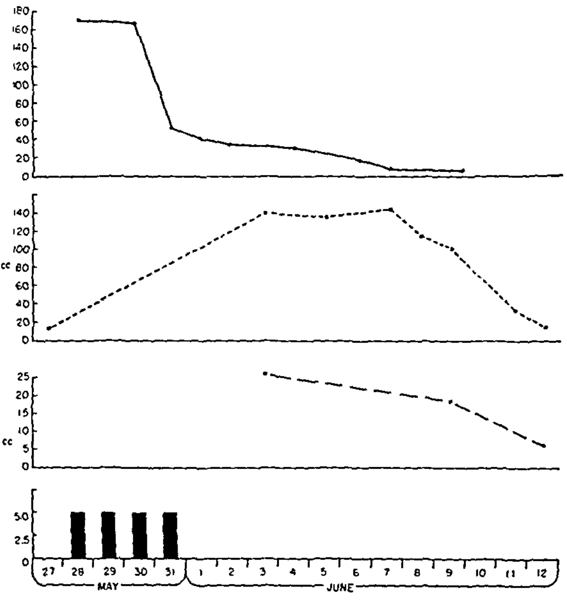

Fig. 1.—Chart showing the fall in the white blood cell count, blood urea nitrogen, and serum uric acid after administration of triethylene melamine.

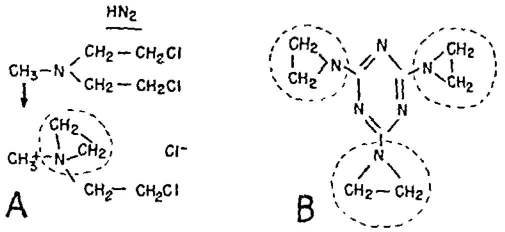

Fig. 2.—Relationship between HN_2 and triethylene melamine. A, ethylenimonium transformation of HN_2. B, triethylene melamine. (Diagram shown through the courtesy of Dr. David Karnofsky.)

The rest of the course of this patient is not pertinent to this case report. In brief, she was subsequently readmitted to Memorial Hospital on Aug. 10, 1950, for relapse of her leukemia, and died on Sept. 4, 1950, having had an attack of acute pulmonary edema three days prior to her death. Permission for an autopsy was not obtained.

COMMENT

Triethylene melamine is one of the compounds used in screening tests for effectiveness against the growth of animal tumors, by the Chemotherapy Division of the Sloan-Kettering Institute of the Memorial Cancer Center. The early results of the use of this drug were reported in a preliminary communication by Rhoads and others.[2] A more comprehensive report by Karnofsky and his associates has recently been published.[3] (This case is included in their series.)

Triethylene melamine is thought to be chemically related to nitrogen mustard (HN_2) by virtue of the ethylenimonium transformation that HN_2 undergoes in the body (fig. 2). It is the ethylene-imine ring which is thought to be the active grouping in both compounds. Triethylene melamine has been found to have actions similar to those seen with HN_2 in much the same range of diseases. The advantages of triethylene melamine are that it can be given by oral administration, smaller amounts of the drug can be used, and fewer unpleasant side effects of the kind obtained with HN_2 are present. Bone marrow depression can be serious with both drugs.

Triethylene melamine was chosen for use in this case because, despite recent x-ray treatment to the spleen, the disease was rapidly progressive, manifesting marked constitutional symptoms, and HN_2 seemed to be a drastic drug to be used on a woman who was already nauseated, vomiting, weak, and anorexic. The rapid fall in total white blood cell count and the diminution in the size of the spleen following the administration of 20 mg. of triethylene melamine given over a four-day period is apparent from the case report. The rapidity and extent of response are a little unusual following this dose in chronic myelogenous leukemia, but may occasionally be seen, and point up the variability with which patients react to oral triethylene melamine and the meticulous care which is necessary in the administration of the drug.

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[2] Rhoads, C. P.; Karnofsky, D. A.; Burchenal, J. H., and Craver, L. F.: Triethylenemelamine in the Treatment of Hodgkin's Disease and Allied Neoplasms, read before the Association of American Physicians, Atlantic City, N. J., May 2-3, 1950.

[3] Karnofsky, D. A.; Burchenal, J. H.; Armistead, G. C., Jr.; Southam, C. M.; Bernstein, J. L.; Craver, L. F., and Rhoads, C. P.: Triethylene Melamine in Treatment of Neoplastic Disease: Compound with Nitrogen-Mustard-like Activity Suitable for Oral and Intravenous Use, A. M. A. Arch. Int. Med 87: 477 (April) 1951.

The hyperuricemia which was associated with the precipitous fall in the white blood cell count led to an increased renal output of uric acid and subsequent obstructive uremia by uric acid crystals. This series of events corresponds with cases of similar nature reported following x-ray therapy, but the onset of uremia was more rapid in this case. It appears that simple measures can be taken in an attempt to prevent such obstruction of the urinary tract. There should be adequate knowledge of the renal function of all leukemic patients prior to therapy. A satisfactory fluid intake should be maintained during treatment, and if the uric acid is high in the blood, purines should be curtailed in the diet. The urine should be kept alkaline to make the uric acid crystals more soluble. If obstruction occurs, attempts at catheterization of the ureters should be carried out, and antibiotics should be administered to combat the infection which invariably accompanies obstruction in the urinary tract. These measures were carried out in the case reported, and success in overcoming the ureteral obstruction and uremia was achieved.

444 E. 68th St.

PRACTICAL SYSTEM FOR THORACENTESIS USING THE BLOOD DONOR SET

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Thoracentesis should be a simple, sterile, and nontraumatic procedure. The use of the standard blood donor set permits the attainment of these criteria. The method is a revival of the old Potain principle and is particularly applicable to the aspiration of serous effusions.

PROCEDURE

The 600 cc. vacuum flasks and the tubing and needles for obtaining donor blood are utilized. The tubing is clamped with a curved forceps, and one of the needles is inserted through the cap of the flask. After preparing the skin and anesthetizing the tissues of the chest wall, the other needle is introduced to a point just within the parietal pleura. The clamp is partially released to permit a moderate rate of flow; a screw-clamp is helpful in maintaining the optimum rate. The tubing is clamped shut when the vacuum is exausted and while the needle is transferred to a second or third bottle.

ADVANTAGES

The system described above using the blood donor set has many advantages.

1. The aspirated fluid is available for study in sterile, noncoagulated form.
2. The patient and the physician are spared the tugging and time involved in the usual syringe and stopcock method. The tubing is compressed, however, to prevent unduly rapid removal of the fluid.
3. Lacerations are frequently inflicted on the visceral pleura with the long sharp instrument on the traditional thoracentesis tray. The shorter needle of the donor set is a reminder that the chest wall is less than 1 in. (2.5 cm.) in thickness in the posterior or midaxillary line of the average slender adult. If the patient is muscular or obese, the tubing may be reversed and the longer needle employed.

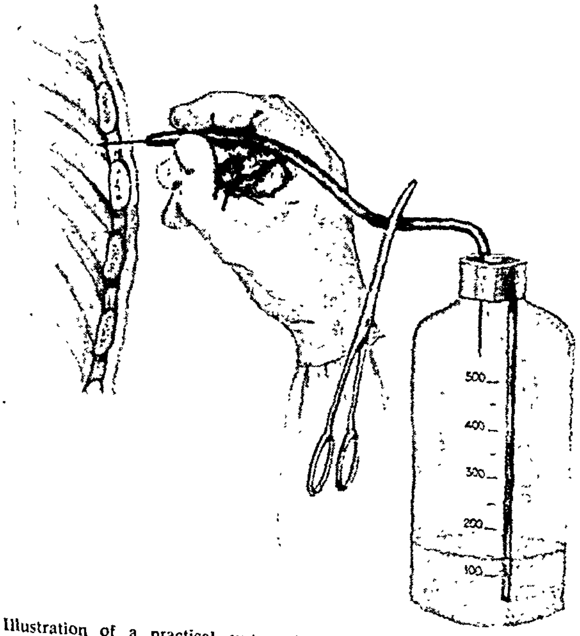

Illustration of a practical system for thoracentesis using the blood donor set.

4. Pneumothorax is avoided with difficulty when the stopcock and syringe are used, but does not occur in the presence of constant suction transmitted from the vacuum flask. For the same reason there is less chance of contaminating the pleural cavity.

CONCLUSION

The ordinary blood donor set may be used to perform thoracentesis simply and efficiently.

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Antibiotic Antagonism.—There appears to be an antagonistic effect between penicillin and aureomycin or chloramphenicol. In other words, penicillin is more effective alone than in combination with either aureomycin or chloramphenicol. This is thought to be due to the fact that aureomycin and chloramphenicol are *bacteriostatic*, thus inhibiting the multiplication of the bacteria. This slows the action of penicillin, which is known to be most effective against bacteria in the rapidly growing phase.—William E. Wellman, M.D., Combinations of Antibiotics in the Treatment of Infectious Diseases, *Minnesota Medicine*, June, 1951.

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COMMUNISTIC TEACHING IN SCHOOLS

A resolution concerning communism in schools which was adopted by the House of Delegates of the American Medical Association at its 1951 meeting in Atlantic City has raised some discussion concerning its intent. Some who have read the resolution reported in THE JOURNAL (June 30, 1951, p. 849) have asked whether this represents an imputation of the public school system of this country or whether it is intended only to draw attention to that minority group of teachers which by subversive teachings embarrasses the loyal educators. Most educators have contributed much to community life and the welfare of the country and have been associated closely and willingly with the other professional groups, particularly those interested in health.

The House of Delegates did not intend to arraign the public school system. Most physicians are products of this system. Nor was there any intention of accusing the majority of school educators of being subversively inclined. In fact, physicians are aware that the American Association of School Administrators together with the National Council of Chief State School Officers joined forces with the American Medical Association and other professional and civic groups to oppose the President's Reorganization Plan No. 1 in 1949 and Plan No. 27 in 1950. Furthermore, the American Association of School Administrators and the National Education Association have made public announcements protesting the hiring of communist teachers. Many physicians and educators have worked industriously for many years to develop programs of mutual interest.

The medical profession has confidence in the teaching profession and believes that it consists mainly of a group of earnest, hard working individuals devoted to the ideals of democracy. However, in any large organization there are certain individuals who do things which do not bring credit to the organization. This is true in practically any aspect of community life. Whether the cause for criticism is due to lack of understanding or a determined, disloyal attempt to undermine the country's standards is not always apparent. The situation can be clarified best by each group studying its particular problem so that it may take whatever action is appropriate.

The American Medical Association, its constituent state associations, component county associations, and other groups for some time have been waging war against attempts to socialize medicine. Such socialization would be just one phase of the development of a program to collectivize and control by federal government all phases of the economic and social structure of this nation. The control of the educational system and the influencing of educators would be a primary objective in this program in spite of the fact that only a free educational system can truly be educational in a democratic sense. Freedom of this system must be protected at all costs. The American Medical Association therefore deplores the efforts of the small but determined and vocal minority of communist-inspired conspirators to impair the good repute of the schools in this country. The members of the Association as citizens and as practitioners, who have experienced the benefits of this nation's schools and whose children are now attending these schools, do not want them destroyed as instruments of democratic government.

RETIREMENT BENEFITS FOR PHYSICIANS

On two occasions the House of Delegates of the American Medical Association has expressed unanimous approval of a suggested amendment to the federal internal revenue laws to permit nonsalaried physicians and other self-employed taxpayers to set up for themselves a retirement benefits program out of income the tax on which would be deferred until the benefits are received. Such a privilege is now extended by federal law to taxpayers who are associated with corporations or who otherwise function as employees but not to the self-employed, who, because of legal, ethical, or other considerations, cannot function as corporate entities. This tax discrimination affects adversely not only physicians but the self-employed of other professional groups, such as lawyers and dentists. For several years, the directors of the Bureau of Medical Economic Research and of the Bureau of Legal Medicine and Legislation have collaborated with other organizations in the development of appropriate federal legislation; only recently they have consulted with a special committee of the American Bar Association in connection with this matter. That committee has completed a draft of legislation which was introduced in the Congress last June by Congressman Keogh, as H. R. 4371, and by Congressman Reed, as H. R. 4373. In the meantime, a new tax bill, H. R. 4473, has been progressing toward enactment. That bill passed the House of Representatives on June 22 and is being considered at the present time by the Senate Finance Committee. In order to expedite Congressional consideration of the retirement benefits proposal, Senator Ives on July 25 introduced as an amendment to the pending tax bill the substance of the Keogh-Reed legislation; this amendment is being considered by the Senate Finance Committee. Favorable action initially by the Committee and later by the Congress would remove a tax inequity that has long existed without understandable justification.

As previously pointed out in THE JOURNAL,[1] the pattern of the economic life of a physician subjects him to a proportionately greater tax burden than is borne by many other self-employed taxpayers. His period of education and training is long. His lifetime earnings are bunched into a comparatively short working lifetime, and by reason of that fact he pays more federal income taxes during his life than do members of many other groups with similar lifetime earnings. In supporting the Ives amendment, physicians are not asking for any special favors. They are suggesting only a more equitable distribution of the tax burden.

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[1] Dickinson, F. G.: Income Tax Discrimination Against the Professions, J. A. M. A. **142**: 1357 (April 29) 1950. Dickinson, F. G., and Bradley, C. B.: Survey of Physicians' Incomes, J. A. M. A. **146**: 1249 (July 28) 1951.

ERADICATION OF MALARIA

It is indicative of the progress in the field of malaria that the 1950 Symposium of the National Malaria Society [1] was concerned with "Nation-Wide Malaria Eradication Projects in the Americas" rather than with "control" of malaria, as in the past. The concept of eradication of a disease implies, according to Soper,[1e] that the roots of infection are so destroyed that the disease will not reappear, in the absence of reintroduction, even though control measures be discontinued. The first suggestion for the "eradication" of malaria according to Andrews,[1a] was made by Dr. Frederick L. Hoffman in 1915, although he probably used the word eradication in the sense of control rather than of complete elimination of the disease. In his presentation, Andrews credits Dr. L. L. Williams Jr. with much of the antimalaria activities in the United States. The Public Health Service, with which Williams was associated, has initiated field investigations, promoted the development of state-level malaria survey and control teams, and organized coordinated major malaria control projects in this country. During World War II, the Office of Malaria Control established by Williams assisted the states in reducing the malaria hazard to trainees and workers around the areas of military importance. Drainage, filling, killing of larvae, entomologic exploration and inspection, and educational activities were carried out by this organization near some 2,200 localities of military importance in 18 different states. These activities are credited with preventing malaria in this country from interfering with the war effort and aborting the increase in national malaria incidence predicted for the early or middle forties.

The military use of DDT as a residual insecticide has established its antimalarial effectiveness and economy, and in 1945 the compound was made available to the states through the Public Health Service, specifically to prevent the transmission of imported malaria. It was sprayed on the interior walls and ceilings of rural homes and privies in counties where relatively high malaria mortality was experienced during the five years preceding World War II. This activity was known as the Extended Malaria Control Program and was carried on for two years.

The National Malaria Eradication Program was initiated in 1947. In planning the program for this country, it was realized that the vectoral species of Anopheles could not be completely annihilated. The elimination of all malaria parasites from the population by mass treatment was also considered difficult of achievement. The approach to the problem was based on the elimination of endemicity and the prevention of its reestablishment. It was believed that, if the numbers of malaria parasite carriers and of vectoral mosquitoes could be reduced at the same time, transmission would become less and less likely. This program could be carried on until ultimately endemic malaria would be eradicated. The decline in transmission was to be achieved by promoting improved diagnosis and treatment of the disease and by reducing the household density of Anopheles with residual insecticides. The second phase of the eradication program to prevent the recurrence of endemicity, involved surveillance and prevention teams assigned to state health departments. The Public Health Service had the cooperation of 13 states concerned in this National Malaria Eradication Program.

In the usual procedure, 5% DDT in a triton®-xylene-water emulsion is applied to internal surfaces of homes and privies at the approximate rate of 200 mg. of DDT per square foot. A review of the reported statistics on malaria mortality and morbidity, of routine diagnostic and survey blood examinations, and of case appraisals supports the contention that our endemic malaria has declined to a very low level. Andrews feels that the reduction of primary malaria in this country during the last 20 years is due in large part to the use of insecticides in the home.

The results with residual DDT spraying of dwellings were even more spectacular in some of the South American republics. According to Gabaldon,[1b] large-scale introduction of the method in Venezuela in 1945 resulted in a decided reduction in malaria incidence. The malaria death rate fell from a median of 112 per 100,000 in 1941-1945 to nine in 1949. Malaria was prevalent in British Guiana in 1947. According to Giglioli,[1c] Anopheles darlingi, the principal transmitter of malaria in the colony, has completely disappeared from all areas in which systematic residual DDT spraying was done. The results of a nationwide malaria control program based on house spraying with DDT in Brazil were reported by Pinotti.[1d] The initial effect was disappearance of all Anopheles from the interior of human dwellings. This development was observed with all five of the Brazilian vector species after the first treatment with DDT. The results suggest that eradication of malaria from large sections of the country may eventually be achieved.

This symposium of the National Malaria Society on "Nation-Wide Malaria Eradication Projects in the Americas," according to Soper,[1e] makes it apparent that the great bulk of the malaria of the Americas is readily suppressed through residual domiciliary spraying. For the first time, there exists a single, efficient, and economical attack on malaria which can be standardized and applied to almost all malarious areas of the Americas.

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[1] Symposium on Nation-Wide Malaria Eradication Projects in the Americas, J. Nat. Malaria Soc. **10**: 99 (June) 1951. (*a*) Andrews, J. M.: I. The Eradication Program in the U. S. A. (*b*) Gabaldon, A.: II. Progress of the Malaria Campaign in Venezuela. (*c*) Giglioli, G.: III. Eradication of Anopheles Darlingi from the Inhabited Areas of British Guiana by DDT Residual Spraying. (*d*) Pinotti, M.: IV. The Nation-Wide Malaria Eradication Program in Brazil. (*e*) Soper, F. L.: V. General Princi of the Eradication Programs in the Western Hemisphere.

THE PRESIDENT'S PAGE

A MONTHLY MESSAGE

As physicians, we are all more or less aware of the extensive scientific activities of our American Medical Association. Most of us, however, are not so familiar with the many valuable public services which the Association renders, because they do not affect us so directly. One of the most important of these is the Association's work in health education of the public.

Our Association pioneered in this field, turning out authentic, interesting health information long before most other health agencies had recognized its value. The A. M. A.'s Bureau of Health Education was first established in 1911 as the Council on Health and Public Instruction. It has been functioning continuously ever since, although it has undergone several reorganizations and name changes.

The present director of the Bureau is Dr. W. W. Bauer, an internationally known leader in public health education. Dr. Bauer, who also edits *Today's Health*, received the Elisabeth Severance Prentiss National Award in Health Education from the Cleveland Health Museum in 1947, and in 1949 he spent three months in Germany as a visiting expert in public health with the American Military Government. He is the author or co-author of 16 books in the health field, and the list of organizations which he serves as health consultant is impressive. Assisting Dr. Bauer with the professional work of the Bureau are two other physicians and an educator, all of whom have extensive experience in the health education field.

The oldest of the Bureau's many activities is answering medical questions sent in to the A. M. A. by laymen. From 12,000 to 15,000 such letters are received annually, averaging about 140 questions per 100 letters. All of them are answered under the supervision of a physician from information in the medical literature. Occasionally unusual or difficult questions are referred to highly qualified consultants who render this service freely and anonymously to the Association.

Another important activity of the Bureau is health education by radio. The A. M. A. entered this field in 1925 with two broadcasts every week day over a Chicago station, one of which was also channeled to the CBS network. In 1933 the Association began presenting weekly health talks over the NBC network, and over a period of years furnished authentic health information on thousands of subjects. This series twice won first place awards from the Institute for Radio in Education, held annually at Ohio State University. Because of the advent of television, which cut the value of network radio, the A. M. A. in 1949 dropped this series in favor of occasional documentary-type network shows.

Another important phase of the Bureau's work in radio started in 1930, when it began preparing and distributing radio scripts for use by local medical societies. This eventually grew into a library of some 1,000 scripts, and the service was continued until World War II, when the heavy drain on physicians' time made the use of scripts difficult. Since medical societies still wanted to continue broadcasting, the Bureau in 1941 began recording health programs. It currently has 25 different 13-week transcribed programs available on a loan basis to medical societies for use on local radio programs.

Television has offered a dramatic new challenge for health education. In 1947 the A. M. A. supervised a series of experimental telecasts on a Chicago station which were similar in character to the present highly successful Johns Hopkins "Science Review." Since then the Bureau has made the first medical network telecast, on atomic energy in medicine, in 1949, and produced a kinescoped dramatic telecast, "Dr. Webb of Horseshoe Bend," in 1950. The latter was televised in 40 of 65 communities having television facilities. To assist local medical societies, the Bureau has prepared packets of sample television scripts with full instructions for presenting "live" shows and also a Television Handbook with general pointers on television. Currently, the Bureau and the A. M. A. Committee on Medical Motion Pictures are conducting an investigation into the use of available health films on television and the possible production of such films especially for television.

In addition to radio, television, and the answering of mail inquiries, the Bureau of Health Education reaches the public through production of pamphlets. Some of these are reprints from *Today's Health;* many are developed by the staff. All are available at cost. The 500,000 copies which the Bureau distributes yearly cover a wide variety of health subjects and are used by medical societies at public meetings, fairs and expositions, and by individual physicians to lighten the load of patient questions.

One of the Bureau's most outstanding contributions has been made in the field of school health. At the time it was first established, the Bureau set up a Joint Committee on Health Problems in Education with the National Education Association. This year that committee is celebrating its 40th year of continuous growth in service and prestige. It has published, among other things, one of the most authoritative books in existence on health education and has exerted great influence through the years for improvement in all phases of school health.

Every two years since 1947, the Bureau has sponsored a National Conference on Physicians and Schools, the proceedings of which have been widely circulated and quoted. The Bureau staff also serves in a consulting capacity to practically every educational organization and through these contacts has been able to effect steady progress in school health.

I have not mentioned the many speaking engagements filled by staff members, the other invaluable contacts of the Bureau with most national organizations interested in public health, or the Bureau's pioneering work in the fight against antivivisectionists and other cults. Suffice it to say that, except for health movies, exhibits, and news releases, which are handled by other departments, there is no area of health education not covered by the Bureau.

Here is constructive, progressive work to which every A. M. A. member can point with pride. The best way we can help our Health Education Bureau is to use its services fully.

John W. Cline, M.D., San Francisco.

MEDICAL NEWS

CALIFORNIA

Loans for Junior Physicians.—The San Francisco Medical Society has established a loan fund for interns and residents in the City and County of San Francisco. Ten thousand dollars has been made available for use in assisting junior physicians in need of financial help to complete a previously planned program of training. All applications are to be considered in the strictest confidence and without unnecessary delay. Applicants are limited to one loan each year except in unusual cases to be determined by the committee for junior physicians and the finance committee. Notes will be signed personally with no co-signers or guarantors required. The principal of the loan is to be repaid within two years after starting practice or, in most cases, within a period of five years after the activation of the loan. The prevailing rate of savings bank interest at the time of the loan will be charged.

COLORADO

State Medical Meeting.—The annual session of the Colorado State Medical Society will be held at the Shirley-Savoy Hotel, Denver, Sept. 18-21 under the presidency of Dr. Ervin A. Hines, Denver. Guest speakers at the general assemblies include the following:

Ralph V. Platou, New Orleans, Prenatal Influences.
Stuart W. Harrington, Rochester, Minn., Clinical Manifestations and Surgical Treatment of Carcinoma of the Breast.
Donald E. King, San Francisco, Common Mistakes in the Treatment of Common Fractures.
Maxwell M. Wintrobe, Salt Lake City, Diagnosis and Treatment of Anemia.
Wilhelm C. Hueper, Bethesda, Md., Environmental Cancer Problems in Colorado.

There will be a symposium on communicable diseases on Wednesday morning, the participants being Drs. Roy L. Cleere and John A. Lichty, Denver, Charles H. Dowding Jr., Aurora, Colo., and Joseph E. Cannon, Denver. On Friday morning the department of dermatology of the University of Colorado School of Medicine will present a symposium on lupus erythematosus. "You and Your A. M. A." will be the subject of a symposium and panel discussion Thursday afternoon. Five 10-minute papers will be given by the following officials of the American Medical Association: Dr. James R. McVay, Kansas City, Mo., Dr. Edward J. McCormick, Toledo, Ohio, Dr. Joseph D. McCarthy, Omaha, Dr. George A. Unfug, Pueblo, Colo., Dr. Frank E. Wilson, Washington, D. C., and Dr. Fred A. Humphrey, Fort Collins, Colo. There will be a question and answer period following the papers. The annual banquet will be held Friday evening. The Women's Auxiliary to the society will meet in conjunction with the association.

CONNECTICUT

Hospital Building Boom.—A survey recently completed by the state medical society shows that the biggest hospital building boom in the state's history is underway at a cost that will exceed 29 million dollars. It involves more than half of the state's 34 community hospitals and ranges from alterations to erection of completely new hospital units. The multimillion-dollar-program will provide more than 1,200 additional hospital beds and an array of new operating rooms, maternity centers, and emergency, diagnostic, and outpatient facilities, as well as laboratories, hospital pharmacies, and dietary and laundry services. The survey discloses that 90% of the 29 million dollar expansion will be paid for by voluntary contributions that already exceed $19,500,000. Government contributions under provisions of the Hill-Burton Act may account for 10%. In several instances applications for government money were not filed, the entire amount being raised locally.

The millions that are being spent are not only flowing into large city hospitals but also into hospitals in smaller communities that serve large rural areas. The survey concerns only privately supported community hospitals, municipal, state, or federal institutions. It covers construction undertaken or completed during the past year, projects currently in progress, and those scheduled to start in the next six to eight months. Among the 18 hospitals engaged in building programs, the largest single project is the new 10-floor memorial unit now under construction at the Grace-New Haven Community Hospital. The building is scheduled for completion in October, 1952, at a cost of 7 million dollars including equipment. It will provide 325 patient beds and all facilities for independent hospital operation.

ILLINOIS

Carroll County Honors Veteran Physician.—Thousands of persons from Carroll County and nearby counties in Illinois and Iowa turned out Aug. 8 to honor Dr. Joseph B. Schreiter, who has practiced in Savanna for 55 years. The ceremony included a parade, a picnic, oratory, and bestowal of various surprise honors on the 76-year-old physician. An invitation was issued to all the 4,000 persons at whose birth Dr. Schreiter has presided. The Illinois State Medical Society sent Dr. Andy Hall of Mt. Vernon, 86-year-old veteran who was chosen the outstanding general practitioner of the nation for 1950 by the American Medical Association, as principal speaker for the occasion. Also representing organized medicine of the state were Dr. C. Paul White of Kewanee, president of the Illinois State Medical Society; Dr. Harold M. Camp of Monmouth, its secretary; Dr. Charles P. Blair of Monmouth, chairman of its council; and Dr. Joseph S. Lundholm of Rockford, state councilor. Many other physicians joined the Carroll County Medical Society in honoring him. Dr. Schreiter was elected coroner in 1903 and still serves in that post, having been re-elected 11 times. He is chief of staff of the Savanna City Hospital. Despite his age and many activities, he still takes care of a substantial practice, making house calls and keeping evening office hours, although he no longer does major surgery.

Chicago

Personal.—F. Ellis Kelsey; Ph.D., associate professor of pharmacology at the University of Chicago, has been appointed director of the chemical department of the Nuclear Instrument and Chemical Corporation, Chicago.

Joins Armour Medical Staff.—Dr. Grosvenor W. Bissell, Buffalo, has joined the clinical investigation group of the medical department of the Armour Laboratories as an assistant medical director. Dr. Bissell has been full-time assistant professor of medicine at the University of Buffalo and director of the endocrinology clinic of Edward J. Meyer Memorial Hospital.

Loyal Davis to Lecture at Oxford.—Dr. Loyal Davis, professor of surgery and chairman of the department at Northwestern University Medical School, has been selected to give the Earl of Litchfield Lecture at Oxford University Oct. 10, on "The Physiological Principles Underlying the Treatment of High Diastolic Hypertension by Thiocyanates and Sympathectomy."

Chicago Heart Association Grants.—Checks totaling $81,050 have been presented to representatives of nine Chicago area medical institutions by the Chicago Heart Association for research projects in heart disease. The grants are the first from funds raised in the association's 1951 drive. The nine institutions are the University of Chicago, Northwestern University, University of Illinois, Loyola University, Chicago Medical School, Michael Reese Hospital, La Rabida Sanitarium, Herrick House, and Women and Children's Hospital for its Heart of the Home cardiac education program under Dr. Margaret H. Austin.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

IOWA

Promotions at State University.—The following persons have been promoted to the rank of assistant professor in the department of internal medicine, State University of Iowa, Iowa City: Drs. Henry E. Hamilton, Walter M. Kirkendall, Paul M. Seebohm, and Raymond F. Sheets Jr. Dr. William Ames was promoted to the rank of associate; Drs. David W. Sinton and Ernest O. Theilen were appointed instructors, and Dr. Margaret Vance was appointed fellow in metabolism. Dr. Murray Franklin resigned to take a position in the department of internal medicine at the University of Illinois, Chicago.

KANSAS

Dr. Murphy Named Chancellor.—Dr. Franklin D. Murphy, dean of the University of Kansas School of Medicine since July 1948, was named chancellor of the University of Kansas July 2, succeeding Chancellor Deane W. Malott, who resigned to become president of Cornell University, Ithaca, N. Y. During his three years as dean Dr. Murphy has strengthened the medical school faculty, and with the State Medical Society and the Farm Bureau he co-authored the Kansas Rural Health Plan, which has already begun to show results. The U. S. Junior Chamber of Commerce selected him in 1949 as one of the 10 outstanding young men of the country, and in June of this year he was elected by the House of Delegates to the Council on Medical Education and Hospitals of the American Medical Association.

MARYLAND

Test State Drivers.—State and county health departments of Maryland are now giving standard driving tests to all personnel who drive state cars in an attempt to improve their habits and reduce accidents. The actual testing was begun July 2 and by the end of August tests will have been completed in each of Maryland's 23 counties. It is expected that about 230 persons throughout the state will be tested this summer. The test, administered by a representative of the Automobile Club of Maryland, consists of three parts. The first part is a written test of traffic and driving knowledge that includes 25 questions. A practical driving test follows, with the examiner accompanying the driver on the road and making notes concerning any errors made. Finally, there is a battery of psychophysical tests which measure performance on standard testing devices. Soon after each test has been made, a report of conclusions reached and possible recommendations for corrective action are sent to the individual tested, the deputy state health officer, bureau chief, or division chief to whom the driver is directly responsible, and also to the chief of the bureau of management.

MINNESOTA

Dr. Dennis Goes to New York.—Dr. Clarence Dennis, professor of surgery at the University of Minnesota Medical School, Minneapolis, will be professor of surgery and director of general surgery, University Division, at the Kings County Hospital, Brooklyn. Dr. Dennis has successively held the positions of instructor, assistant professor, and associate professor of surgery at the University of Minnesota, and was appointed professor of surgery there in 1947.

MISSISSIPPI

Malaria in Korean Veterans.—According to Dr. Archie L. Gray, of the Mississippi State Board of Health, seven proved and two probable cases of malaria were reported in Mississippi during the first six months of 1951. All of the cases have been reported since May 24 and have occurred only in military personnel who had served in Korea. The ages of those infected ranged from 19 to 27 years. Six Plasmodium vivax infections and one Plasmodium malariae infection were confirmed by laboratory examination. Two cases in which laboratory confirmation was not obtained had received treatment a short time before blood smears were taken. Six of the cases had had suppressive treatment while in military service in Korea, and one has a suggestive history of malaria prior to military service. Dr. Gray states that the presence of this number of known cases of malaria in Mississippi is disturbing since local outbreaks may occur in the communities to which these veterans have returned.

MONTANA

State Medical Meeting.—The annual session of the Montana Medical Association will be held at the Meadow Lark Country Club, Great Falls, Sept. 13-16 under the presidency of Dr. Clyde H. Fredrickson of Missoula. Guest speakers at the scientific sessions include the following:

Robert H. Williams, Seattle, Adrenal Physiology and Therapy.
Russell R. de Alvarez, Seattle, Hysterectomy.
Thomas H. Holmes, Seattle, Life Stress and Respiratory Disorders.
K. Alvin Merendino, Seattle, Heart Surgery: An Evaluation of the Present Status with a Look into the Future.
Thomas B. Carlile Jr., Seattle, Clinical Use of Radioactive Isotopes.
Robert J. Neville, Teaneck, N. J., Staff Management of Poliomyelitis.
Kenneth A. Phelps, Minneapolis, Dangerous Complications of Tonsillectomy in Children.

There will be noon panel discussions on Thursday and Friday conducted by the guest speakers. At the banquet Friday at 7 p. m., Frank G. Dickinson, Ph.D., director, Bureau of Medical Economic Research, American Medical Association, Chicago, will speak on "The Shortage of Physicians: Phantom or Fact." Technical exhibits will be on display. The State Academy of Oto-Ophthalmology and Obstetrical and Gynecological Society, the Montana Pediatric Society, and the Montana Chapter of the American Academy of General Practice will hold dinner meetings Thursday evening. The Women's Auxiliary to the association will meet Sept. 13-15 with headquarters at the Rainbow Hotel in Great Falls.

UTAH

State Medical Meeting.—The Utah State Medical Association will hold its annual session in the Union Building at the University of Utah, Salt Lake City, Sept. 13-15 under the presidency of Dr. Vivian P. White, Salt Lake City. Out-of-state speakers include the following:

Carl A. Moyer, Dallas, Texas, General Principles of the Supportive Care of Trauma.
William J. Dieckmann, Chicago, Toxemias of Pregnancy.
Charles L. Martin, Dallas, Texas, Uterosalpingography for Treatment of Sterility in the Female.
Vernon D. E. Smith, St. Paul, Thrombo-Embolism: Post-Operative Prophylactic Anti-Coagulation Therapy.
Frank B. Walsh, Baltimore, Recent Advances in Ophthalmological Diagnosis of Systemic Disease.
Lawrence W. Kinsell, Oakland, Calif., Present Status of the Clinical Application of ACTH and Cortisone.
Arthur C. Curtis, Ann Arbor, Mich., Cutaneous Lesions as a Manifestation of Systemic Disease.
Irvine McQuarrie, Minneapolis, Spontaneous Hypoglycemosis as a Clinical Problem.

On Thursday morning there will be a surgical round table with Dr. Ralph T. Richards, Salt Lake City, as moderator, and the discussants Drs. Smith, Moyer, Dieckmann, Martin, and Walsh. A medical round table will be held Friday afternoon with Dr. Louis E. Viko acting as moderator. The discussants will be Drs. Wintrobe, Kinsell, Curtis, McQuarrie, and John Z. Bowers of Salt Lake City. The banquet will be held Friday evening in the ballroom of the Hotel Utah beginning at 7 p. m. Dr. Smith will give an illustrated lecture entitled "The Cradle of Modern Skiing."

ALASKA

Medical Election.—Officers of the Alaska Territorial Medical Association for 1951-52 include Dr. Howard G. Romig, Anchorage, president; Dr. John O. Bangeman, Wrangell, first vice president; Dr. John H. Clements, Juneau, second vice president, and Dr. William P. Blanton, Juneau, secretary-treasurer.

GENERAL

Surgical Congress.—The third annual meeting of the Southwestern Surgical Congress will be held at the Hotel Jefferson, St. Louis, Sept. 24-26. Reservations may be secured by writing directly to the hotel. Registration will begin at 12 noon Sept. 23 and at 8 a. m. on each succeeding day. There will be a $10 registration fee for non-members of the congress.

Keyes Memorial Medal.—Dr. William F. Braasch, professor of urology at the Mayo Foundation in Rochester, Minn., has been awarded the Dr. Edward L. Keyes gold medal of the American Association of Genito-Urinary Surgeons for his "outstanding

Association of Military Surgeons of the United States, Palmer House, Chicago, Oct. 8-10. Colonel James M. Phalen, Armed Forces Institute of Pathology, Washington 25, D. C., Secretary.

Colorado State Medical Society, Denver, Sept. 18-21. Mr. Harvey T. Sethman, 1612 Tremont Place, Denver 2, Executive Secretary.

Delaware, Medical *Society of, Wilmington, Oct. 8-10. Dr. Andrew* H. Gehret, 1007 Park Place, Wilmington, Secretary.

District of Columbia, Medical Society of, Hotel Statler, Washington, Oct. 1-3. Mr. Theodore Wiprud, 1718 M St. N.W., Washington, Secretary.

Kansas City Southwest Clinical Society, Municipal Auditorium, Kansas City, Mo., Oct. 1-4. Dr. Maxwell G. Berry, 630 Shukert Bldg., Kansas City, Mo., Director of Clinics.

Kentucky State Medical Association, Columbian Auditorium, Louisville, Oct. 2-5. Dr. *Bruce Underwood*, 620 S. *Third* St., Louisville 2, Secretary.

Michigan State Medical Society, Grand Rapids, Sept. 26-28, Dr. L. Fernald Foster, 606 Townsend St., Lansing 15, Secretary.

Mississippi Valley Medical Society, Peoria, Ill., Sept. 19-21. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.

Montana Medical Association, Great Falls, Sept. 13-16. Mr. L. R. Hegland, 104 N. Broadway, Billings, Executive Secretary.

Nashville Postgraduate Medical Assembly, Maxwell House, Nashville, Tenn., Oct. 3-5. Dr. W. G. Kennon Jr., 647 Doctors Bldg., Nashville 3, *Secretary.*

Neurosurgical Society of America, Sun Valley, Idaho, Sept. 12-14. Dr. C. D. Hawkes, 22 N. Manassas St., Memphis 5, Tenn., Secretary.

Nevada State Medical Association, Riverside Hotel, Reno, Sept. 13-15. *Dr. Wesley W. Hall, 307 W. Sixth St., Reno, Secretary.*

New Hampshire Medical Society, Equinox House, Manchester, Vermont, Sept. 30-Oct. 2. Dr. Deering G. Smith, 44 Chester St., Nashua, Secretary.

Northeastern Section, Southeastern Surgical Congress, Lord Baltimore Hotel, Baltimore, Sept. 13-15. Dr. W. Raymond McKenzie, Medical Arts Bldg., Baltimore 1, Secretary.

North Texas-Southern Oklahoma Fall Clinical Conference, Wichita Falls, Texas, Sept. 19. Dr. W. L. Powers, 517 Hamilton Bldg., Wichita Falls, Chairman.

Oregon State Medical Society, Masonic Temple, Portland, Oct. 10-13. Dr. Robert F Miller, 833 S.W. Eleventh Ave., Portland 5, Secretary.

Pennsylvania, Medical Society of the State of, Pittsburgh, Sept. 16-20. Dr. Walter F. Donaldson, 500 Penn Ave., Pittsburgh 22, Secretary.

Southwestern Surgical Congress, Hotel Jefferson, St. Louis, Sept. 24-26. Dr. C. R. Rountree, 1227 Classen St., *Oklahoma City* 3, Secretary.

Texas Academy of General Practice, Shamrock Hotel, Houston, Texas, Sept. 10-11. Dr. B. H. Bayer, 104 E. 20th St., Houston 8, Secretary.

U. S. Chapter, International College of Surgeons, Palmer House, Chicago, Sept. 10-14. Dr. Arnold S. Jackson, 1516 Lake Shore Drive, Chicago, Executive Secretary.

Utah State Medical Association, Salt Lake City, Sept. 13-15. Dr. T. C. Weggeland, 42 S. Fifth East St., Salt Lake City, Secretary.

Vermont State Medical Society, Equinox House, Manchester, Sept. 30-Oct. 2. Dr. *James* P. Hammond, 542 Main St., Bennington, *Secretary.*

Virginia, Medical Society of, Virginia Beach, Oct. 7-10. Mr. Richard H. Nash, 1105 W. Franklin St., Richmond, Executive Secretary.

Washington State Medical Association, Olympic Hotel, Seattle, Sept. 9-12. Dr. James W. Haviland, 338 White-Henry-Stuart Bldg., Seattle, Secretary.

Western Society of Electro-Encephalography, Olympic Hotel, Seattle, Sept. 7-8. Dr. Nicholas A. Bercel, 450 N. Bedford Drive, Beverly Hills, Calif., Secretary.

Wiscnosin, State Medical *Society of, Hotel Schroeder and* Milwaukee Auditorium, Milwaukee, Oct. 1-3. Mr. Charles H. Crownhart, 704 E. Gorham St., Madison 3, Secretary.

Wyoming State Medical Society, Rock Springs, Sept. 27-29. Dr. Glenn W. Koford, 2020 Carey Ave., Cheyenne, Secretary.

INTERNATIONAL

European Congress on Rheumatism, Barcelona, Spain, Sept. 24-27. Dr. Gunnar Edströn, Lund, Sweden, Secretary.

General *Practitioners Study Club International*, Rome, *Italy*, Sept. 12-15. Dr. John O'Connell, 10300 Lackland Road, St. Louis 14, Mo., U. S. A., President.

International Anesthesia Research Society, London, England, Sept. 3-7. Mr. R. W. Cope, University College Hospital, London W.C.1, England.

International Association of Allergists, Zurich, Switzerland, Sept. 23-29. Prof. A. S. Grumbach, Hygiene Institut der Universitaet Zurich, Gloriastr. 32, Zurich, Switzerland.

International Congress of Anesthesiology, Nursing School of the Salpiettre, 47 Boul de l'Hospital, Paris, France, Sept 20-22. 12 rue de Seine, Paris 6ᵉ, France, Secretariat.

International Congress on Industrial Medicine, Instituto Superior Técnico, Lisbon, Portugal, Sept. 9-15. Dr. Luis Guerreiro, Instituto Nacional do Trabalho e *Previdência, Praça do Comercio*, Lisbon, *Secretary* General.

International Congress on Mental Health, Mexico City, Mexico, Dec. 11-19. Mrs. Grace E. O'Neill, Division of World Affairs, National Association on Mental Health, 1790 Broadway, New York 19, N. Y.

International Gerontological Congress, Hotel Jefferson, St. Louis, Mo., U. S. A., Sept. 9-14. Dr. John E. Kirk, 5600 Arsenal Street, St. Louis 9, Mo., Chairman, Program Committee.

International Poliomyelitis Congress, Copenhagen, Denmark, Sept. 3-7. *Prof.* Dr. Niels Bohr, Statens Seruminstitut, 80 Amager Blvd., Copenhagen S., Denmark, President.

International Society of Surgery, Paris, France, Sept. 24-29. Dr. L. Dejardin, 141, rue Belliard, Brussels, Belgium, Secretary General.

International Society for the Welfare of Cripples, Fifth World Congress, Stockholm, Sweden, Sept. 9-14. Mr. Donald V. Wilson, 54 E. 64th St., New York 21, N. Y., U. S. A., Executive Director.

Pan Pacific Surgical Association Congress, Honolulu, Hawaii, Nov. 7-19. Dr. Forrest J. Pinkerton, Suite 7, Young Bldg., Honolulu, Hawaii, *President.*

World Confederation for Physicial Therapy, Copenhagen, Denmark, *Sept. 7-8.*

World Medical Association, Stockholm, Sweden, Sept. 15-21. Dr. Louis H. Bauer, 2 E. 103d St., New York 29, N. Y., U. S. A., Secretary General.

EXAMINATIONS AND LICENSURE

NATIONAL BOARD OF MEDICAL EXAMINERS

National Board of Medical Examiners: *Parts I and II.* Various Centers. *Sept. 5-7 (Part I only). Applications must* be filed at least thirty days prior to an examination. Ex. Sec., Mr. E. S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

American Board of Anesthesiology: *Oral.* Memphis, Oct. 14-17. Sec., Dr. Curtiss B. Hickcox, 80 Seymour St., Hartford 15, Conn.

American Board of Dermatology and Syphilology: *Written.* Chicago, March 1952. *Oral.* Chicago, May 1952. Final date for filing application is Feb. 1, 1952. Sec., Dr. George M. Lewis, *66* E. *66th St.*, New York 21.

American Board of Internal Medicine: *Written.* Various centers, Oct. 15. Final date for filing applications was May 1. *Oral.* The schedule of oral examinations for 1951 has been arranged on a regional basis as follows: New York, Nov. 12-15, covering Maine, Massachusetts, New Hampshire, New York and Vermont. San Francisco, Oct. 22-24, covering Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming. Final date for filing applications is Sept. 1.

Only candidates who have not taken an oral examination can be admitted under the schedule arranged thus far.

Oral examinations in the subspecialties will be held at the same time and place and on the same distribution.

Exec. Sec., Dr. William A. Werrell, 1 W. Main St., Madison 3.

American Board of Neurological Surgery: *Oral.* Chicago, Oct. 25-26. *Oral* Chicago, May 1952. Final date for filing applications for the May 1952 examination is Jan. 1, 1952. Sec., Dr. W. J. German, 789 Howard Ave., New Haven 4, Conn.

American Board of Obstetrics and Gynecology: *Written.* Feb. 1, 1952. Final date for filing applications is Nov. 1. *Oral.* Chicago, June 7-13, 1952. Final date for filing application is Feb. 1, 1952. Sec., Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

American Board of Ophthalmology: *Written.* Twenty-five centers, Feb. 4-5, 1952. *Oral. Chicago, October 8-13. Sec.*, Dr. Edwin *B.* Dunphy, 56 Ivie Road, Cape Cottage, Maine.

American Board of Orthopaedic Surgery: Final date for filing applications for the 1952 Part II examinations is Nov. 30, 1951. Sec., Dr. Harold A. Sofield, 122 S. Michigan Ave., Chicago 3.

American Board of Otolaryngology: *Oral.* Chicago, Oct. 8-12. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City.

American Board of Pediatrics: *Oral:* Buffalo, Oct. 26-28. Ex. Sec., Dr. John McK. Mitchell, 6 Cushman Rd., Rosemont, Pa.

American Board of Plastic Surgery: Denver, Oct. 27-29. Final date for filing of case reports is Aug. 30. Sec., Dr. Bradford Cannon. Office of the Board: 4647 Pershing Ave., St. Louis 8.

American Board of Preventive Medicine: *Written.* San Francisco, October 28. *Oral.* San Francisco, *October 29. Sec.*, Dr. Ernest L. Stebbins, 615 North Wolfe St., Baltimore 5.

American Board of Proctology: Philadelphia, Nov. 17-18. Sec., Dr. Louis A. Buie, 102-110 Second Ave., S.W., Rochester, Minn.

Amercian Board of Psychiatry and Neurology: *Oral* New York, Dec. 17-18. Final date for filing applications is Sept. 1. Act. Sec., Dr. David A. Boyd Jr., 102-110 Second Ave., S.W., Rochester, Minn.

American Board of Radiology: *Oral.* Washington, D. C., Sept. 17-22. Sec., Dr. B. R. Kirklin, 102-110 Second Ave., S.W., Rochester, Minn.

American Board of Surgery: *Written.* Various centers, Oct. 1951. *Final* date for filing applications was July 1. *Written.* Various Centers. March 1952. Final date for filing application is Dec. 1, 1951. Sec., Dr. J. Stewart Rodman, 225 S. 15th St., Philadelphia.

Board of Throacic Surgery: Written. Various parts of the country. Sept. 14, 1951. Final date for filing applications was July 15. *Oral.* St. Louis, Nov. 2. Sec., Dr. William M. Tuttle, 1151 Taylor Ave., Detroit 2, Mich.

American Board of Urology: Chicago, Feb. 9-13, 1952. Final date for filing applications is Sept. 1. Sec., Dr. Harry Culver, 30 Westwood Rd., *Minneapolis 16.*

DEATHS

Hamilton, Benjamin Wallace ✠ New York; University of Pennsylvania Department of Medicine, Philadelphia, 1901; since 1936 secretary of the Medical Society of the County of New York; member of the House of Delegates of the American Medical Association from 1937 through 1940, in 1945 and 1946, and in 1949 and 1950; fellow of the New York Academy of Medicine; secretary of the Physicians Loan and Relief Fund, treasurer of the Physicians Home and trustee of the New York Physicians Mutual Aid Association; for many years affiliated with Willard Parker Hospital; served as medical editor of *New York Medicine;* died June 4, aged 73.

Cassels, Louis Raymond, Worcester, Mass.; Tufts College Medical School, Boston, 1911; police surgeon; died in Worcester City Hospital May 30, aged 65, of carcinoma of the esophagus with metastases.

Coachman, Edwin Horace ✠ Muskogee, Okla.: University of Michigan Medical School, Ann Arbor, 1926; member of the American Academy of Ophthalmology and Otolaryngology; specialist certified by the American Board of Otolaryngology; formerly member of the school board; affiliated with Muskogee General and Oklahoma Baptist hospitals; eye, ear, nose, and throat consultant and surgeon, U. S. Veterans Administration Hospital; died May 24, aged 48.

Colby, Fred Bennett, Fitchburg, Mass.; Université de Lausanne Faculté de Médecine, Switzerland, 1937; member of the American Medical Association and the Industrial Medical Association; for many years member of the board of health; affiliated with Burbank Hospital, where he died May 24, aged 42, of coronary sclerosis.

Dinsmore, William Wert, Hartford, Conn.; Johns Hopkins University School of Medicine, Baltimore, 1907; served as associate medical director of the Travelers Insurance Company; died in Charlotte, N. C., May 17, aged 68, of cerebral hemorrhage.

Drew, Horace Rainsford, Jacksonville, Fla.; University of the South Medical Department, Sewanee, Tenn., 1901; member of the American Medical Association; past president of the Florida Medical Association and the Duval County Medical Society; veteran of the Spanish-American War; in 1916 elected to the associate staff at St. Luke's Hospital, where in 1926 he became chief of the department of medicine, and in 1933 chief of staff; died May 28, aged 74, of bronchiectasis and emphysema.

Farmer, Lucius Pierce, Stapleton, Ga.; University of Georgia School of Medicine, Augusta, 1906; served during World War I; died May 1, aged 70.

Gallion, William Earnest, Oakdale, Tenn.; Lincoln Memorial University Medical Department, Knoxville, 1909; served as mayor of Oakdale; head of the Selective Service for Morgan County during World War II; for many years company surgeon for the Southern Railroad; died in Knoxville May 26, aged 71, of cerebral hemorrhage.

Golitzin, Alexander V., Los Angeles; University of Moscow Faculty of Medicine, Russia, 1901; on the staff of Presbyterian Hospital-Olmsted Memorial; died May 4, aged 74, of hypertensive cardiovascular disease.

Greenwald, Samuel, New York; New York Homeopathic Medical College and Flower Hospital, New York, 1918; on the staff of Manhattan General Hospital, where he died June 9, aged 55, of coronary thrombosis.

Griffith, Charles Allen ✠ River Forest, Ill.; Rush Medical College, Chicago, 1908; director of the River Forest State Bank; on the executive staff at West Suburban Hospital in Oak Park, where he died May 25, aged 71, of carcinomatosis and diabetes mellitus.

Hicks, Louis Calvin, Indianapolis; Medical College of Indiana, Indianapolis, 1903; died May 28, aged 73, of rheumatic heart disease.

Holmgren, Knut David, Ottumwa, Iowa; Northwestern University Medical School, Chicago, 1910; veteran of the Spanish-American War; died in the Veterans Administration Hospital, Des Moines, May 28, aged 73, of bronchogenic carcinoma and congestive heart failure.

Howard, Everett Edmunds, Gainesville, Fla.; University of Louisville (Ky.) School of Medicine, 1913; member of the American Medical Association; served during World War I; formerly practiced in Peoria, Ill., where he was on the staffs of the Methodist and Proctor hospitals; director of student health, University of Florida Infirmary; died May 15, aged 64, of pulmonary embolus.

Jessner, Kurt Joachim, Fairfield, Maine; Ludwig-Maximilians-Universität Medizinische Fakultät, Munchen, Bavaria, Germany, 1909; member of the American Medical Association and the American Trudeau Society; assistant superintendent of the Central Maine Sanatorium; died in Waterville May 14, aged 65, of acute heart failure.

Knight, James Wesley, Madison, Wis.; Creighton University School of Medicine, Omaha, 1949; resident at St. Mary's Hospital; died May 12, aged 28, of brain tumor.

Larned, Samuel Francis, Syracuse, N. Y.; University of Pennsylvania School of Medicine, Philadelphia, 1912; member of the American Medical Association; died May 27, aged 64, of coronary occlusion.

Leonard, Lothair Lewis ✠ Asbury Park, N. J.; University of Vermont College of Medicine, Burlington, 1904; fellow of the American College of Surgeons; affiliated with Barre City Hospital in Barre, Fitkin Memorial Hospital in Neptune, and Monmouth Memorial Hospital in Long Branch; died May 17, aged 77, of coronary thrombosis.

Lewitin, Leo H., Brooklyn; Medizinische Fakultät der Universität, Wien, Austria, 1927; member of the American Medical Association; affiliated with Beth El Hospital and United Hospital, where he died March 17, aged 51, of infectious hepatitis.

Lowry, Nelson Horatio ✠ Chicago; the Hahnemann Medical College and Hospital, Chicago, 1910; fellow of the American College of Surgeons; affiliated with Illinois Masonic Hospital and Edgewater Hospital, where he died May 17, aged 66, of acute myocardial infarction.

Marchand, Malvin Carl, Oroville, Calif.; University of Kansas School of Medicine, Kansas City, 1943; member of the American Medical Association; served during World War II; died in Wells, Nev., May 19, aged 36, of injuries received in an automobile accident.

Milbee, Robert S., Sullivan, Wis.; Trinity Medical College, Toronto, Canada, 1900; died in Dalston, Ontario, Canada, March 15, aged 75, of chronic myocarditis and chronic pyelonephritis.

Reid, Rufus Tinsley, Syracuse, N. Y.; University of Virginia Department of Medicine, Charlottesville, 1911; member of the American Medical Association; died in the University Hospital May 26, aged 64, of cerebral hemorrhage.

Riess, John Turk, Red Budd, Ill.; Washington University School of Medicine, St. Louis, 1905; member of the American Medical Association; served during World War I; on the staff of St. Clement's Hospital; died June 20, aged 81, of heart disease.

Salzman, Jacob Yetter, Newark, Ohio; University of Pennsylvania School of Medicine, Philadelphia, 1909; member of th American Medical Association; died May 11, aged 71, of c cinoma.

✠ Indicates Fellow of the American Medical Association.

GOVERNMENT SERVICES

NAVY

Class of Flight Surgeons.—A naval flight surgeon class was graduated on Aug. 2 from the U. S. Naval School of Aviation Medicine, Pensacola, Fla. The class consisted of both regular and reserve medical officers. Having successfully completed 16 weeks of specialized training in the medical phase of aviation medicine, and six weeks of training in aircraft and helicopters, the graduates are now qualified for duty within the aeronautical organization of the Navy. Their primary mission will include the selection and the care of aviation personnel, the study of the aviator's operational problems, and continued research in the field of aviation medicine. Honor man in the class was Lt. (J.G.) E. J. Schoen of New York City, who compiled an academic average of 91.1 for the entire course.

Thirty student naval flight surgeons in the next class at the School of Aviation Medicine, accompanied by two faculty members, departed from Corry Field by air Aug. 13 for a four-day familiarization trip to various medical research centers of the Navy and Air Force. Visits will be made to the Human Acceleration Laboratory, Johnsville, Pa.; the Special Devices Center, Long Island; the Aero Medical Equipment Laboratory, Navy Yard, Philadelphia; and the Air Force Aero-Medical Laboratory at Wright-Patterson Field, Ohio. Field trips of this type are considered an essential part of the modern training of young naval flight surgeons, and were inaugurated by the School of Aviation Medicine in 1949.

Guest Lecturer at Naval Medical Center.—Dr. Leo H. Bartemeier, Detroit, Mich., president-elect of the American Psychiatric Association, was the guest lecturer at the Naval Medical School, Bethesda, Md., March 30. His subject was "The Attitude of the Physician."

Personals.—Rear Adm. Lamont Pugh, the Surgeon General, on June 9 addressed the annual dinner of the medical alumni of the University of Virginia at Charlottesville. Admiral Pugh departed July 6 on an inspection of Naval Medical Department facilities in the Pacific and Far East and will return to Washington by way of Alaska early in August.

Dr. Howard T. Karsner, medical research advisor to the Surgeon General, sailed for England June 29 to confer with the officer in charge of the London branch, Office of Naval Research. Dr. Karsner has also been designated the Navy delegate to the International Congress of Clinical Pathology, which is to be held in London July 16-20, where he will present a paper on "Pathology of Pulmonary Circulation." After visiting Germany in connection with research matters, he plans to return to the United States in early August.

Rear Adm. John Harper, MC, District Medical Officer, Third Naval District with headquarters in New York, retired on June 30 after 36 years of active duty. The Admiral's home address will be 4202 Yuma St., N.W., Washington, D. C.

Capt. Howard H. Montgomery, MC, USN, was placed on the retired list July 1 after 33 years of active military service. Captain Montgomery will be associated with the Blood Program of the National Red Cross in the Eastern Area Office, Alexandria, Va.

PUBLIC HEALTH SERVICE

German Physicians in Training.—Seven German physicians are in the United States for six months of advanced training under programs supervised by the Division of International Health of the Public Health Service. The training is conducted under a fellowship plan sponsored by the U. S. High Commissioner for Germany. They are Dr. Rudolf Haarstrick, preparing for a post with a child guidance clinic in the Bremen area on his return to Germany, who is studying psychiatric techniques and use of psychotherapy in child guidance clinics; Dr. Irene Haas, public health officer in Geisenheim, who is studying psychiatric techniques and use of psychotherapy in child guidance clinics; Dr. Karlheinz Hahn, public health officer in Darmstadt, who is studying public health practice and administration; Dr. Eugen Schildge, scientific assistant in the Psychiatric and Neurological Clinic, University of Freiburg, who is studying electroshock, psychotherapy, and other modern methods for treating mental illness; Dr. Gerhard Schorsch, chief medical officer of Bethel-Bielefeld Psychiatric Hospital and professor of neurology and psychiatry at the Bethel Theological College, who is studying modern psychiatric techniques, clinical and surgical, and United States methods of treating and caring for epileptics; Dr. Herbert Viefhues, psychiatrist at State Mental Hospital, Wieslock-Heidelberg, who is studying psychiatric techniques and the organization of mental health programs; and Dr. Siegfried Wagner, public health officer in Freising, who is studying public health administration.

Electrokymography.—Since radiologists and cardiologists first observed the movements of the cardiovascular silhouette on fluoroscopic screens, motions of the beating heart have been of intense interest in the study of heart disease. Researchers of Temple University School of Medicine and the Public Health Service, have developed the electrokymograph in a joint effort to discover a more adequate instrument for recording the movements of the heart and great vessels. Essential element of the device is a photomultiplier tube, which observes the movements of the heart as they appear on a fluoroscopic screen and translates the border movements and density changes to current changes. These current changes actuate a galvanometer to record a beam type of tracing on moving bromide paper. The record is called an electrokymogram. Recordings of the carotid pulse wave, the electrocardiograph, the phonocardiograph, and the electrokymograph can be made simultaneously to provide additional means for study and interpretation.

The first conference in the new field of electrokymography was held recently, and a monograph has been published by the National Heart Institute entitled "Electrokymography." The book consists of 22 scientific papers, with a discussion following each paper, and a complete bibliography. The conference was carefully planned to cover and give proper emphasis to the clinical, physiological, and technical aspects of electrokymography. A limited number of copies of the monograph may be secured without cost from the National Heart Institute, Bethesda 14, Md.

VETERANS ADMINISTRATION

Hospital News.—Dr. Gregory Pincus, Director of the Worcester Foundation for Experimental Biology, on March 2, addressed the staff at the Veterans Administration Hospital, Northport, L. I., N. Y., on the "Role of the Adrenal Cortex in Schizophrenia."——Dr. Nolan D. C. Lewis, professor of psychiatry, Columbia University, addressed the staff March 13, 1951, on the diagnosis of schizophrenia and its treatment.——Dr. Paul Hoch of the Psychiatric Institute, New York, addressed the staff on March 26 on "Personality Changes After a Lobotomy or Topectomy." On April 12 Dr. Sandor Rado, clinical professor of psychiatry at Columbia University, addressed the hospital staff on "Emergency Behavior."——Dr. H. Houston Merritt, professor of neurology at Columbia University, New York, addressed the staff April 26 on "The Use of ACTH in Nervous and Mental Diseases."

FOREIGN LETTERS

DENMARK

Correction of Speech Defects.—The publication in the near future of a textbook for teachers specializing in speech defects is just one of many signs that this particular problem is now receiving close attention in Denmark. With a population of barely four million, Denmark in 1930 had some 6,000 children suffering from defects of speech. The census yielding this figure was carried out by the Danish Department of Statistics, which undertook a survey of 451,000 children of school age. As many as 5,619 of these children (12.4%) had defects of speech. As this survey included only about 96% of all the children of school age, the above figure was raised to about 6,000. Stammering and incoordinated speech affected 2,270 of the 5,619, and stammering was found to be four times as common among boys as among girls. Among the 2,270 stammering children, there were only 89 who had received treatment at the state institute for speech defects and the majority had received no special treatment whatever.

These and many other disquieting facts emerging from this survey led the authorities to bestir themselves, and a special school with resident accommodation for 56 children and teaching facilities for 85 at a time was opened. Yet the calls made on the state institute for speech defects have continued to be so great that, as recently pointed out by Dr. Blegvad, there have been as many as 500 on the waiting list at one time. To meet what has become a veritable crisis, the authorities have developed an alternative scheme which promises well. It consists of a network throughout the country of carefully trained teachers who teach speech correction in the patient's home. The Danish Medical Association has cooperated with the Speech Teachers' Association in organizing an examining body responsible for the training of teachers specializing in speech correction. These teachers have a course of training of at least six months with an expert, spend 180 hours in the practice of teaching at the Institute, and also take part for a week in a special class. Candidates for these appointments must present evidence of an already fairly high educational standard. These teachers will to a certain extent enjoy the status of authorized masseurs, and the medical profession throughout Denmark is encouraged to make use of them. A list of them with the addresses of each is published as a supplement to a recent issue of the organ of the Danish Medical Association, *Ugeskrift for Laeger.* On this list there are between 80 and 90 names for Copenhagen and the surrounding districts alone.

Surgical Treatment of Gastric Ulcer.—At a meeting of the medical society in Copenhagen in 1944, a discussion of the comparative merits of the surgical and medical treatment of gastric and duodenal ulcer showed a definite swing in favor of the former. This trend is further illustrated by a follow-up study in 1949 of patients treated surgically during the period 1942-1945 at the Copenhagen City Hospital. The authors of this study, M. Björneboe, H. Faber, O. Mikkelsen, and E. Tobiassen, made a careful follow-up examination of 202 of the 207 patients discharged in the above-mentioned period. Cases of acute perforation were not included in this study, and the operation was usually a resection, a gastroenteroanastomosis being undertaken in only 30 cases. There were seven times as many men as women, and, while most of the patients undergoing resection were between the ages of 31 and 60, the age of most of those undergoing gastroenteroanastomosis was between 51 and 70. In nearly every case the chief indication for operation was pain. The operation mortality was 5.8% for the resections and 3.3% for the gastroenteroanastomoses. At the follow-up examination 86% of the resection cases and 83% of the gastroenteroanastomosis cases showed satisfactory recovery. Not one of the patients had died of hemorrhage or perforation after operation.

These findings are compared with those of N. B. Krarup, who in 1946 published an account of 665 patients receiving medical treatment in the period 1931-1938 at the Bispebjerg Hospital in Copenhagen. His follow-up study showed that 3% of his patients had died of hemorrhage or perforation during the observation period and that only 29% could be regarded as cured; 36% showed some improvement. Favorable as this comparison is for operative treatment, it does not tell the whole story. Since 1945 great advances have been made in the operative treatment of gastric and duodenal ulcer, owing to the availability of penicillin, to better narcosis, and to various other factors not operative before this year. In the five-year period 1946-1950, there were only 12 postoperative deaths among the 710 resection cases (1.7%) at the City Hospital, and in 1949 and 1950 there were only three postoperative deaths among fully 300 resection cases. It should also be noted that the 3% mortality from hemorrhage or perforation following conservative treatment had no counterpart in the surgically treated cases on record.

Centenary of Dr. Adolph Sell.—Born on Dec. 24, 1850, Adolph Sell came to be the founder and successful organizer of institutional treatment of epilepsy on a large and generous scale in Denmark. The son of a prosperous artisan, he qualified as a doctor in 1875, having passed his examinations with such distinction that his father financed his postgraduate tour to Vienna and Paris. On returning home, he did not pursue his further medical studies in the hospitals of Copenhagen but started general practice in the provinces, where he was so successful that he soon had to employ an assistant. By this means he was able to extend his postgraduate studies to Scotland and Germany. In the latter country he came under the influence Fr. v. Bodelswingh, who was in charge of a hospital setup consisting of many small houses surrounded by gardens; this sheltered epileptics, lunatics, and cripples, who were encouraged to live as natural a life as possible. Workshops in which these patients found employment were an innovation. At the age of 34, Sell printed a work entitled "Concerning the Significance of the Emotions as Causes of Disease." This work, submitted to the University of Copenhagen as a doctorate of medicine thesis, was rejected, presumably because it did not reflect the scientific standards of Dr. Sell's judges. It was perhaps this episode which some two years later inspired another work, in which Sell wrote among other things, "In science, psychology will appear as a new and great movement when materialism has perhaps played out its last ideal card: bacteriology."

In 1897, Sell called a meeting of his friends to discuss the creation of a colony for epileptics. An appeal was issued for funds, and a modest start was made with an epileptic picked up in the streets of Copenhagen. As the colony grew around this nucleus, Sell had to meet campaigns against him in the press, and on more than one occasion his colony was visited by inspectors looking for irregularities, which they could not find. When he died in 1921, and was succeeded by Dr. H. I. Schou, his colony had become a veritable country town with some 30 houses, a church, shop, laundry, and several hundred hospital beds. The colony was a private, self-supporting concern, to which neither the government nor the municipal authorities had contributed. In the report of this institution for the year 1948-1949, it was pointed out that Filadelfia is the only special hospital for epileptics in Denmark. While some 5% of Denmark's 14,000 epileptics are treated in Filadelfia and another 5% in various other hospitals, the remaining 90% continue to be treated at home by general practitioners.

The items in these letters are contributed by regular correspondents in the various foreign countries.

CORRESPONDENCE

DEATH FOLLOWING USE OF CURARE

To the Editor:—This letter is in reference to the case report submitted by Dr. H. Zimmerman in the June 30, 1951 issue of The Journal. This case of prolonged postoperative respiratory paralysis and death followed the administration of *d*-tubocurarine and syncurine® (decamethylene-1,10-bistrimethylammoniumdibromide) during ether anesthesia. The editorial heading of this report is entitled "Death Following Curare Administration."

On the basis of information submitted, it seems unlikely that *d*-tubocurarine is the cause of prolonged respiratory paralysis. In this instance *d*-tubocurarine and syncurine® have been loosely and inaccurately lumped together in the title. Several points should be mentioned to prevent confusion and misconception in the minds of readers. While both agents produce myoneural block and motor paralysis, *d*-tubocurarine acts in a distinctly different pharmacological manner than does syncurine.® "Decamethonium (syncurine) and *d*-tubocurarine cause neuromuscular block by fundamentally different mechanisms. Block by decamethonium is due to a persistent end-plate depolarization, analogous to an exaggeration of the normal excitant action of acetylcholine: block by curare is due to an antagonism to the normal action of acetylcholine" (Paton, W. D. M., and Zaimis, E. J.: Actions and Clinical Assessment of Drugs Which Produce Neuromuscular Block, *Lancet* **2:**568 [Nov. 18] 1950). In addition these two drugs should not be used on the same patient during surgery. "Curarization with *d*-tubocurarine almost completely abolished the response to the subsequent injections of C 10 (syncurine)" (MacFarlane, D. W., and co-workers: Evaluation of Curarizing Drugs in Man; Antagonism to Curarizing Effects of D-Tubocurarine and Decamethylene-Bis [Trimethylammonium Bromide], *J. Pharmacol. & Exper. Therap.* **99:**226 [June] 1950). The term curarization is best restricted to drugs which, like *d*-tubocurarine, act by raising the motor plate threshold to acetylcholine.

Prolonged respiratory paralysis has been mentioned in occasional cases following syncurine® (Harris, L. C., Jr., and Dripps, R. D.: The Use of Decamethonium Bromide for the Production of Muscular Relaxation, *Anesthesiol.* **11:**215 [March] 1950; Foldes, F. F., and Machaj, T. S.: Syncurine (Decamethonium-Bromide): Its Use with Pentothal-Sodium and Nitrous Oxide-Oxygen Anesthesia in Abdominal Surgery, *Anesthesiol.* **12:**366 [May] 1951). Similar cases have been revealed in personal conversations. As far as I am aware, such prolonged paralysis is not associated with the administration of *d*-tubocurarine in the dose used in this case. It would seem that adequate pulmonary ventilation should be sufficient therapy in the situation described. Although neostigmine and "tensilon" (a derivative of neostigmine) are effective pharmacological antidotes to *d*-tubocurarine, there is none at present against syncurine.® *d*-Tubocurarine is such a valuable agent that any lethal complication ascribed to it must be carefully evaluated. Unwarranted incrimination of curare as a cause of death will cause physicians to reject without proper reason an excellent adjuvant to anesthetic agents.

Samuel L. Lieberman, M.D.,
581 Eggert Road,
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ITEMIZING OF PHYSICIANS' STATEMENTS

To the Editor:—I am very interested in the statement in the Secretary's newsletter urging doctors to itemize their bills. I think that they should go still further and itemize their charges for each office visit. With this in mind some years ago we adopted what we first called a charge slip but changed to services rendered because people regarded it as an invitation to charge their accounts rather than as an itemized statement. We also felt that patients who could sign for charge purchases in the department stores could sign the slip acknowledging the receipt of the services rendered. This has enabled us to avoid many disputed accounts such as when "Veda's" husband says he gave his wife money to pay the account or when apparently they just simply forgot they were in the office. This has eliminated many unpleasant instances in our practice because the husband who says that his wife paid the account or that they just can't remember ever being to us for any services cannot deny his or his wife's signature on the slip. In addition we itemize it in detail so that a patient knows exactly what services he received and is not astonished when he receives a lump sum bill for a complete physical examination with perhaps an electrocardiograph and laboratory work. Our patients are much better satisfied with this itemized statement for each visit and no longer do they feel that the doctor is holding them up when the bill is more than three or four dollars regardless of the services rendered.

In our area, where some of the roads are good and some are bad and where travel sometimes is difficult, a number of us have quit charging by the mile and merely charge by the hour of elapsed time necessary to care for that patient. We charge from $1.50 to $3.00 fee for an office call and $3.00 to $5.00 for a home visit as a basic charge, adding in other services rendered, such as a pelvic examination or a blood count or injection of penicillin, and on long home visits or procedures that require a good deal of time we simply bill for so many hours' service. Patients are used to it and we feel that it is much fairer in that we do not penalize a person who lives on a good road by charging the same fee we would if he lived on a bad road difficult to use.

This particularly applies to night calls when a few days later all the patient remembers is that you got up at night and made a home visit and completely forgets the extra 30 to 60 minutes you had to sit around to be sure the hypodermic medication had given relief. And it also lessens the burden of explanation when the six members of a family with acute food poisoning are seen, as I did not long ago, and each member requires a different size dose of morphine, atropine and other therapy. At the time they were so sick anything seemed reasonable to them. Two weeks later when the account was paid it would have been difficult to justify the charges necessary without explaining that it involved 2½ hours at night plus two injections for each of the six members of the family. I think that elaboration on this, which I do in my classes in general practice at the University of Louisville and Meharry, would be of assistance to many young physicians starting out in practice.

D. G. Miller Jr., M.D., Morgantown, Ky.

MALE BREAST CARCINOMA AND ESTROGEN THERAPY

To the Editor:—In a recent report by Dr. Charles C. Higgins and me on "Bilateral Carcinoma of the Male Breast After Estrogen Therapy" (*J. A. M. A.* **146:**7 [May 5] 1951), it was inferred that the bilateral breast malignancies might be due to carcinogenic effect on male breast tissue. Through the courtesy of the Crile General Hospital, however, it has recently been learned that at autopsy the neoplasms evidenced in the bladder and in the breast were indistinguishable histologically. It is impossible, therefore, to conclude that there was a positive relationship between estrogen therapy and the breast tumors, despite the strongly suggestive evidence at the time of biopsy.

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MEDICAL LITERATURE ABSTRACTS

AMERICAN

A.M.A. Am. Journal Diseases Child., Chicago

81:753-872 (June) 1951

Trichobezoar in Children: Review of Literature and Report of Two Cases. S. Hurwitz and P. F. McAlenney.—p. 753.
Pediatrician's Role in Management of Personality Problems of Adolescents. W. A. Schonfeld.—p. 762.
Cortisone in Treatment of Sclerema Neonatorum. E. L. Kendig Jr. and E. C. Toone Jr.—p. 771.
Excretion of Creatine and Creatinine by Children. L. C. Clark Jr., H. L. Thompson, E. I. Beck and W. Jacobson.—p. 774.
Portable Humidifying Unit. R. M. Smith and R. Denton.—p. 784.
Expanding Scope of Oligophrenia: Increasing Range of Syndrome Associated with Mental Defect. R. Gibson.—p. 803.

American Journal of Surgery, New York

81:481-594 (May) 1951

*Krukenberg Tumors of Ovary. J. J. Berens.—p. 484.
Non-Puerperal Inversion of Uterus. H. W. Jones Jr.—p. 492.
Measurement of Blood Loss During Surgical Operations. J. J. Bonica and C. S. Lyter.—p. 496.
Photographs, Infrared Photographs and Transillumination Diagrams Illustrating Diagnosis and Treatment of Cervix Uteri. L. R. Thompson. —p. 503.
Intravenous Use of Pituitrin for Labor. S. Lubin, S. R. M. Reynolds, R. Waltman and others.—p. 509.
*Diagnostic Value of Differentiating Between Morphologically Identical Cells by Tissue Culture. M. E. Sano and C. T. Bello.—p. 515.
Prolongation of Spinal Anesthesia (75 to 100 Per cent) with Levophed Intrathecally: Preliminary Report. H. M. Ausherman.—p. 521.
Prefrontal Lobotomy for Relief of Intractable Pain. J. G. Lyerly.—p. 526.
Surgical Treatment of Extracerebral Hematoma in Acute Craniocerebral Injury. W. Klingensmith and H. C. Voris.—p. 533.
Congenital Malformations of Rectum and Anus: With Special Reference to Treatment of Associated Fistulas. E. E. Arnheim.—p. 538.
Combined Abdominoperineal Resection for Carcinoma of Rectum. M. B. Welborn.—p. 548.
Colorectal Polypectomy. S. S. Pasachoff.—p. 552.
Anesthetic Management for Massive Intra-Abdominal Resections. J. W. Uhl, H. M. Livingstone and J. G. Allen.—p. 554.
Surgical Management of Post-Thrombotic Syndrome with Reference to Use of Sympathectomy. G. H. Pratt.—p. 562.
Leg Ulcers of Vascular Origin and Their Therapy. E. J. Orbach.—p. 568.

Krukenberg Tumors of Ovary.—One of the most interesting and disputed points concerning Krukenberg tumors is the mode of spread from the primary focus to the ovaries, because there is a paucity of lesions along the path between the primary lesion and the ovaries. Four possible routes are commonly listed: (1) the lymphatic route; (2) peritoneal sedimentation with implantation of cells on the ovaries; (3) hematogenous spread, and (4) direct extension to the ovaries. Most investigators support the first or second of these theories. There is little evidence to support the hematogenous route of spread. The author says that in primary tumors of the lower abdominal cavity direct extension is possible, but most of the parent tumors that yield Krukenberg tumors of the ovaries are in the upper abdomen. He gives descriptions of five cases of Krukenberg tumors observed in 10 yr. at the Cincinnati General Hospital. The average age of these patients was 41 yr. One noteworthy case occurred in a girl, 13, the earliest age at which Krukenberg tumor has ever been reported. The malignant growth apparently developed in the premenarche period, which is characterized by great endocrine activity. The course from onset of symptoms until death was only about three months. The numerous metastases found at autopsy suggest that some of the secondary growths (in liver, lung, diaphragm, calvarium, and dura mater) resulted from vascular spread. Lymphatic spread probably accounts for the involvement of the regional lymph nodes, mesentery, and retroperitoneal tissues. The mode of extension from the primary tumor in the sigmoid to the ovary was not explained. The Krukenberg tumors in all five patients were considered to be secondary to gastrointestinal neoplasms. Two patients had carcinoma in the sigmoid colon; one had carcinoma of the hepatic flexure, and two had gastric ulcerations that were probably malignant.

Tissue Culture for Differentiation Between Morphologically Identical Cells.—In a patient with pleural effusion, where other methods had failed to disclose the cause of this condition, a tissue culture of cells in the pleural fluid made possible the diagnosis of a pleural endothelioma. There was a striking variation in the appearance of the cells in tissue culture 24 and 48 hr. after culture, as compared to the cells in sections of the centrifuged fluid. Results in this case led to studies on many other pleural effusions; the histories of three such patients and of one in whom lymph node tissue was cultured are presented in this paper. Illustrations accompanying each case report show side by side the photomicrographs of the cells in the centrifuged pleural fluid (or lymph node section) and those in the tissue culture. The method at first gave some unsatisfactory results in cases of pleural effusions obtained from advanced malignant lesions in which the histopathological diagnosis was evident. This is not surprising in view of all the toxic substances present. The use of Tyrode's solution to wash away the erythrocytes greatly increased the growth. The tissue culture method is intended primarily for obscure cases, and occasionally no additional information will be gleaned from it. However, until more reliable methods are available, the authors offer tissue culture as a diagnostic aid.

Bulletin of Johns Hopkins Hospital, Baltimore

88:395-498 (May) 1951

Effect of Adrenocorticotropic Hormone (ACTH) and Cortisone on Histamine Reactions and Anaphylactic Reactions in Guinea Pigs. S. W. Landau, W. A. Nelson and L. N. Gay.—p. 395.
Studies on Afibrinogenemia: I. Afibrinogenemia in Patient with Septic Abortion, Acute Yellow Atrophy of Liver and Bacteremia Due to E. Coli. C. L. Conley, O. D. Ratnoff and R. C. Hartmann.—p. 402.
Id.: II. Defibrinating Effect on Dog Blood of Intravenous Injection of Thromboplastic Material. O. D. Ratnoff and C. L. Conley.—p. 414.
*Streptomycin in Treatment of Tuberculous Pericarditis. D. Carroll. —p. 425.
Pathology of Osseous Changes in Cushing's Syndrome in Infant and in Adults. R. H. Follis Jr.—p. 440.
Modified One-Stage Hepatectomy in Dog: With Some Notes on Effect of Hepatectomy on Coagulability and Proteolytic Activity of Blood. R. C. Clay and O. D. Ratnoff.—p. 457.
"Giant Molecules" and Cholesterol in Relation to Atherosclerosis. A. Keys.—p. 473.

Streptomycin in Tuberculous Pericarditis.—Carroll analyzes the course of untreated tuberculous pericarditis in 71 patients and reports the results of streptomycin therapy in five additional patients. Of the untreated patients, 40.5% died of widespread tuberculosis, 8.5% died of cardiac failure, and 19.5% survived for five years or more. The fate of the others is unknown. Only three of the 21 patients alive five years or more after the original pericarditis had any signs or symptoms attributable to previous tuberculous pericarditis. Of the five streptomycin-treated patients, one became asymptomatic after a four-month course of therapy, one who received streptomycin for only two weeks succumbed to widely disseminated tuberculosis, and three showed signs of constrictive pericarditis after the systemic disease was brought under control. In these three patients early corrective surgical intervention was made possible by streptomycin therapy. Important factors in the recovery of these patients were the early institution of therapy and the continuation of bed rest and streptomycin therapy for long periods after surgical correction of constrictive pericarditis. The principal value of streptomycin in these cases lay in its ability, in adequate dosage, to prevent dissemination of tuberculosis.

The Association library lends periodicals to members of the Association and to individual subscribers in Continental United States and Canada for a period of five days. Three journals may be borrowed at a time. Periodicals are available from 1940 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied with stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted.

Circulation, New York

3:641-800 (May) 1951

Effect of Vegetable Fat Ingestion on Human Serum Cholesterol Concentration. E. A. Hildreth, S. M. Mellinkoff, G. W. Blair and D. M. Hildreth.—p. 641.
Ventricular Fibrillation Due to Digitalis Preparations: Review and Report of Two Cases Following Intravenous Administration of Acetyl Strophanthidin. C. D. Enselberg, J. P. Croce Jr. and B. Lown.—p. 647.
*Effect of Angiocardiography on Heart as Measured by Electrocardiographic Alterations. W. J. Zinn, D. C. Levinson, V. Johns and G. C. Griffith.—p. 658.
Studies Utilizing Portable Electromagnetic Ballistocardiograph: I. Abnormal HIJK Patterns in Hypertensive and Coronary Artery Heart Disease. H. Mandelbaum and R. A. Mandelbaum.—p. 663.
Normal Blood Pressure in Superficial Venous System of Man at Rest in Supine Position. A Ochsner Jr., R. Colp Jr. and G. E. Burch.—p. 674.
Effect of Local Application of Glyceryl Trinitrate (Nitroglycerine) on Raynaud's Disease and Raynaud's Phenomenon: Studies on Blood Flow and Clinical Manifestations. M. S. Kleckner Jr., E. V. Allen and K. G. Wakim.—p. 681.
Extensive Calcification of Myocardium: Report of Case. A. C. Ernstene and J. B. Hazard.—p. 690.
Digital Vascular Resistance in Normal, Polycythemic and Hypertensive States. M. Mendlowitz.—p. 694.
Kidney Function in Cor Pulmonale: Particular Consideration of Changes in Renal Hemodynamics and Sodium Excretion During Variation in Level of Oxygenation. A. P. Fishman, M. H. Maxwell, C. H. Crowder and P. Morales.—p. 703.
Blood Pressure in Unanesthetized Rat: I. F. Olmsted, A. C. Corcoran and I. H. Page.—p. 722.
Id.: II. Spontaneous Variations and Effect of Heat. F. Olmsted, A. C. Corcoran and I. H. Page.—p. 727.
Initial Vibrations of First Heart Sound. T. Counihan, A. L. Messer, M. B. Rappaport and H. B. Sprague.—p. 730.
Q-T Interval in Chronic Cor Pulmonale. J. K. Alexander, M. I. Ferrer, R. M. Harvey and A. Cournand.—p. 733.
Retrograde Conduction from Premature Ventricular Contractions, Common Occurrence in Human Heart. A. D. Kistin and M. Landowne.—p. 738.
Postural Electrocardiographic Changes in Healed Myocardial Infarction. B. L. Brofman, H. Feil, H. K. Hellerstein and A. M. Jones.—p. 752.
Abnormal Cardiac Rhythms Caused by Acetylcholine. D. Scherf and F. B. Chick.—p. 764.
Effects of Cortisone and ACTH on Acute Phase of Rheumatic Fever. A. R. Barnes.—p. 770.

Effect of Angiocardiography on Heart.—Six patients studied by angiocardiography or aortography were checked by a direct-writer type of electrocardiograph during the procedure. The diseases found consisted of pulmonary stenosis, coarctation of the aorta, aneurysm of the ascending aorta, ventricular septal defect (two cases), and atrial septal defect associated with complete transposition of the great vessels. Immediate ischemic changes, as evidenced by T-wave inversion, were induced by rapid injection of 75% sodium iodomethamate (neo-iopax®). Irritable ventricular foci with frequent and prolonged bursts of ventricular tachycardia were frequently produced. Both events are delayed in onset and may persist for at least one-half hour after the injection of sodium iodomethamate. Premedication with adequate amounts of quinidine or procaine amide appeared to lessen the hazard of the procedure. Retrograde aortography when indicated may not present so great a cardiac risk as angiocardiography, probably because less of the contrast medium contacts the myocardium. It is concluded that direct-writer continuous electrocardiographic observation during angiocardiography should be maintained at all times. It is cautioned that the procedure is diagnostic and not therapeutic. As angiocardiography is associated with a 0.4% to 1.0% mortality, the procedure should be surrounded by all possible safeguards.

GP (J. Am. Acad. Gen. Practice), Kansas City, Mo.

3:1-160 (May) 1951

*ACTH and Chronic Bronchial Asthma. M. S. Segal, J. A. Herschfus and L. Levinson.—p. 33.
Pathologic or Spontaneous Fractures. W. H. Bickel and J. R. Barber.—p. 41.
To Nurse or Not to Nurse. E. J. DeCosta, M. S. Mark and R. A. Reis.—p. 47.
When Children Won't Eat. L. Steine.—p. 53.
Splanchnicectomy in Hypertension. R. H. Smithwick.—p. 57.
Treatment of Leukemia. F. R. Miller.—p. 62.

Corticotrophin (ACTH) and Chronic Bronchial Asthma.—This is a report on the use of corticotrophin (ACTH) in the management of 20 patients with severe bronchial asthma who had been subject to asthmatic attacks for one to 30 yr. Most of these patients were in status asthmaticus, and all had shown poor response to intensive conservative treatment. An initial dose of 40 mg. was followed by 40 mg. six hours later; then 20 mg. was administered every six hours until maximum benefit had been observed for two days. The time interval was then increased to every eight hours for one to two days and from the fifth day on to every 12 hr. If adequate eosinopenia did not develop after 100 mg. had been given, the dosage schedule was increased. The total dose of a single course of therapy varied from 240 mg. to 900 mg., and the duration of treatment from two and a half days to 19 days. Two patients required three courses and three patients two courses of therapy. All but three of 27 courses of therapy were followed by partial or complete remissions. One patient did not respond satisfactorily to two courses of corticotrophin and one course of cortisone. Eighteen courses of therapy were followed by complete remissions lasting from nine days to seven months. In evaluating the continued therapeutic effect, the authors arbitrarily considered remissions that lasted less than one week as failures, those from one to two weeks as fair, those from two to four weeks as good, and those longer than four weeks as excellent. With this grading, the continued therapeutic effects must be regarded as failures in three cases, as fair in eight, as good in 10, and as excellent in six. Repeated, short intensive courses of therapy are more effective in long-term management than are attempts to prolong the initial remission with daily maintenance therapy.

Iowa State Medical Society Journal, Des Moines

41:169-208 (May) 1951

Dissecting Aneurysm of Aorta. H. J. Hartman and H. Shulman.—p. 172.
Longevity Studies: Length of Life and the Aged Population in Iowa. R. Ginzberg and W. C. Brinegar.—p. 174.
Osteoporosis, Review. P. W. Berney.—p. 182.
Medical Education in Time of National Emergency. S. W. Olson.—p. 185.
Hypertrophic Pyloric Stenosis: Case Report of Infantile Type Followed by Adult Type. J. W. Dulin and A. E. Ady.—p. 188.

41:209-244 (June) 1951

Gynecologic Endocrinology in General Practice. W. M. Allen.—p. 209.
Review of 50 Operated Cases of Protruded or Ruptured Intervertebral Discs in Lumbar Areas. H. G. Decker and J. E. Brennan.—p. 215.
Sterilizations Approved by Iowa's State Board of Eugenics 1949. C. J. Gamble.—p. 218.
Interstitial Myocarditis in Infancy: Report of Case. J. S. Downing.—p. 220.

Journal Lab. and Clinical Medicine, St. Louis

37:665-830 (May) 1951

Radioiron Studies in Case of Hemochromatosis. T. Alper, D. V. Savage and T. H. Bothwell.—p. 665.
Urinary Excretion of Gallium by Man and Animals. J. I. Munn, N. H. Walters and H. C. Dudley.—p. 676.
Further Studies on Recovery from Radiation Injury. L. O. Jacobson, E. L. Simmons, E. K. Marks and others.—p. 683.
Response of Serum Gamma Globulin Level and Complement Titer to Adrenocorticotropic Hormone (ACTH) Therapy in Lupus Erythematosus Disseminatus. J. H. Vaughan, T. B. Bayles and C. B. Favour.—p. 698.
In Vivo and in Vitro Effects of Aureomycin Hydrochloride on Syringospora (Monilia, Candida) Albicans. M. Moore.—p. 703.
Nocardia Asteroides: Studies of Its Pathogenicity and Drug Sensitivities. E. H. Runyon.—p. 713.
Reaction of Human Serum and Component Proteins of Human Plasma with Quarternary Ammonium Salt, Octab. R. F. Jacox.—p. 721.
Reaction of Human Serum with Quarternary Ammonium Salt: Results of Serial Study in Acute Rheumatic Fever. R. F. Jacox and R. G. Gale.—p. 728.
Estimation of Nonglucosamine Polysaccharides of Serum Proteins with Anthrone Reagent. M. M. Graff, E. M. Greenspan, I. R. Lehman and J. J. Holechek.—p. 736.
Twenty-Four Hourly Endogenous Creatinine Clearance as Clinical Measure of Functional State of Kidneys. A. A. Camara, K. D. Arn, A. Reimer and L. H. Newburgh.—p. 743.
Effect of Cortisone on Experimental Production of Arteritis by Passive Sensitization. S. G. Cohen and C. Moses.—p. 764.
ACTH-Like Effect of Fever in Man. W. M. Kirkendall, R. E. Hodges and L. E. January.—p. 771.
Effect of ACTH and Cortisone on Pneumococcal and Influenza Viral Infections in White Mouse. E. H. Kass, S. H. Ingbar, M. M. Lundgren and M. Finland.—p. 780.
Effect of Oxygen Tension and of pH on Sickling and Mechanical Fragility of Erythrocytes from Patients with Sickle Cell Anemia and Sickle Cell Trait. R. D. Lange, V. Minnich and C. V. Moore.—p. 789.

Journal of Nervous and Mental Disease, New York

113:377-470 (May) 1951

Observations on Homosexuality Among University Students. B. H. Glover.—p. 377.
Skin: Psychodynamic and Psychopathologic Concepts. S. H. Zaidens.—p. 388.
Self-Inflicted Dermatoses and Their Psychodynamics. S. H. Zaidens.—p. 395.
Part II. Treating Migraine by "Sleep-Rationing." M. Gans.—p. 405.
Self-Inflicted Pre-Frontal Lobotomy: Report of Case. G. A. Colom and M. H. Levine.—p. 430.
Study of Unstable Personalities After Combat. J. J. Klein.—p. 437.
*Cerebral Blood Flow and Metabolism in Psychoses of Senility. F. A. Freyham, R. B. Woodford and S. S. Kety.—p. 449.

Psychoses of Senility.—The 10 patients chosen for this study represent two types of organic disturbances: (1) psychosis with cerebral arteriosclerosis (six cases) and (2) senile psychosis (four cases). Differentiation between these two entities is difficult. The diagnosis of senile psychosis is usually based on certain behavioral characteristics that occur in the absence of noticeable vascular pathology, but, in cases of senile psychosis, it is difficult to exclude degenerative processes of the cerebral blood vessels. The case histories indicate that the 10 cases have in common progressive behavioral deterioration and psychotic changes of personality associated with senile organic disturbances. Cerebral blood flow was determined by the nitrous oxide method, with the use of a special gas mixture. Mean arterial blood pressure was obtained by means of a damped mercury manometer attached to a needle in the femoral artery. The authors calculated the cerebral metabolic rate in terms of cerebral oxygen consumption by multiplying the difference in the oxygen content between the arterial and internal jugular blood by the cerebral blood flow. In calculating the cerebrovascular resistance, a measure of the caliber of the cerebral vessels, the mean arterial blood pressure was divided by the cerebral blood flow. The data obtained strongly suggest that the senile psychoses are the result of a significant reduction in cerebral oxygen utilization on the basis of an increased cerebrovascular resistance and its resultant reduction in blood flow through the brain. There is no essential difference in this respect between the two clinical classifications of "psychosis with cerebral arteriosclerosis" and "senile psychosis." A comparable series of elderly persons without psychosis should be studied, for only in this manner could it be demonstrated that the psychosis depends on circulatory and metabolic changes.

Journal of Urology, Baltimore

65:693-936 (May) 1951. **Partial Index**

Teratoid Tumors of Testis. R. A. Moore.—p. 693.
Feminizing Adrenal Tumor in Adult Male. H. Mortensen and L. Murphy.—p. 709.
Abnormalities of Kidneys, Ureters, and Perinephric Fascia: Anatomic and Clinical Study. J. A. Benjamin and C. E. Tobin.—p. 715.
*Hydronephrosis in Infants and Children. M. Campbell.—p. 734.
Effects of Intrarenal Hydronephrosis on Components of Renal Cortex. C. L. Deming.—p. 748.
Pregnancy and Labor Complicated by Pelvic Ectopic Kidney. G. W. Anderson, G. G. Rice and B. A. Harris Jr.—p. 760.
Thoraco-Abdominal Incision in Urological Surgery. R. Chute.—p. 784.
Primary Carcinoma of Ureter. J. A. Taylor.—p. 797.
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Consideration of Problems Incident to Performance of Uretero-Enterostomy: Report of Technique. W. F. Leadbetter.—p. 818.
Electrolyte Imbalance Following Bilateral Ureterosigmoidostomy. H. S. Doroshow.—p. 831.
Carcinoma of Bladder: Correlation of Pathology with Treatment and Prognosis. W. S. Kerr Jr. and F. H. Colby.—p. 841.
Technique of Retropubic Prostatectomy. E. Burns.—p. 856.
*Mortality of Transurethral Prostatic Resection. C. D. Creevy.—p. 876.
Relationship of Steroids to Some Problems in Prostatic Cancer and to Medicine in General. W. P. Herbst.—p. 883.
Preliminary Report on Clinical Use of Tace (Chlorotrianisene) in Treatment of Prostatic Carcinoma. P. G. Smith, T. W. Rush and A. T. Evans.—p. 886.

Hydronephrosis in Infants and Children.—The occurrence of hydronephrosis is reported in 828 infants and children. The condition was discovered at necropsy in 316 cases and was disclosed by urologic investigation during life in 512 patients. Bilateral hydronephrosis was observed in 359 cases (43.4%). Of the 512 patients, 49 refused treatment or did not receive it. Of those treated, 82 died and 84 were cured, i. e., urinary stasis was relieved, the urine sterilized, and renal function adequate to support life for a reasonable number of years was achieved. There was improvement in 169 patients. Thirty-seven in whom stasis persisted were therapeutic failures and the others were lost to observation. Hydronephrosis is the commonest abdominal tumor of childhood at which time it results oftenest from congenital causes. In rare instances the obstruction is acquired as in urinary calculus disease or spinal injury. The pathological changes are fundamentally those of renal destruction and are anatomically characterized by pelvicalyceal dilatation, parenchymal thinning, sclerosis, and destruction of secretory elements. The indications for complete urologic examination of children with hydronephrosis are many, but persistent or acute pyuria, pain, or a mass in the loin or abdomen, hematuria, and reflex vesical disturbances are the usual symptoms. The diagnosis is readily suggested by excretory urographic study and can be established by satisfactory retrograde and preferably bilateral pyelography. Treatment is surgical when indicated, but occasionally conservative therapy by instrumental dilation may be successful. In most cases operation is necessary. It may not always be radical, yet in a third to a half of the children in whom hydronephrosis has been clinically recognized, the severity of the renal damage necessitates total nephrectomy. With early diagnosis and proper treatment, most of these kidneys as well as the lives of many patients should be saved.

Mortality Rate in Transurethral Prostatic Resection.—Free hemoglobin formed in the bladder by contact between blood and the plain water used as irrigating fluid during transurethral prostatic resection may be driven into the circulation when large prostatic veins are opened. When this free hemoglobin reaches the kidneys, renal vasospasm results and may lead to severe or fatal renal damage, particularly in the presence of rapid loss of blood, hypotension, bacteremia, or preexisting renal damage. This reaction is prevented by the use of an isotonic irrigating solution, such as dextrose, aminoacetic acid, or mannitol, and the morbidity and mortality rates of transurethral resection of the prostate are consequently lowered. In a series of 1,000 consecutive cases in which transurethral resection was done by the author with dextrose and aminoacetic acid as the irrigating solutions, the surgical mortality rate was 0.6%; this is about as low as can be expected in surgical interventions on elderly men. The operative mortality rate was 5.3% in 2,435 open enucleations from many smaller series reported in the literature between 1945 and 1950. It seems reasonable to suppose that the difference between the mortality rate in the author's series and that of other series is due to the use of isotonic irrigating fluid. A mortality rate lower than that ordinarily attained by many experts with the open operations may be achieved in transurethral resection with the use of nonhemolytic solutions on patients who are, on the average, very poor risks.

Northwest Medicine, Seattle

50:401-480 (June) 1951

*Infantile Cortical Hyperostosis with Involvement of Ilium. C. A. Racely, J. B. Bilderback and W. Y. Burton.—p. 418.
Sunburn Prevention: Vanishing Cream Effectively Opaque to Actinic Rays. W. J. Hemphill.—p. 424.
Management of Respiratory Failure in Acute Poliomyelitis. R. W. Maxwell, J. Muenster and R. F. L. Polley.—p. 425.
Primary Carcinoma of Fallopian Tube. R. D. Forbes and B. L. Finlayson.—p. 429.
Banthine in Herpes Zoster. H. S. Brown, R. D. Reekie and W. J. Sinclair.—p. 432.

Infantile Cortical Hyperostosis.—It has been recognized that infantile cortical hyperostosis may be the result of poisoning with vitamin A. This paper presents the histories of four such children who were seen during the past three years at the Hospital for Children at the University of Oregon, Portland, Ore. All the children had received vitamin supplements. None were breastfed. Two patients showed changes in the ilium not previously described. Clinical symptoms are of little differential value, since the general irritability and upset feeding habits are present in metabolic disease, infectious diseases, and hypertrophic pyloric stenosis. Tender, soft tissue swelling over the mandibles, scapulas, clavicles or extremities requires roentgenographic examination of the underlying bone. Roentgenographic appearance is the best basis for early diagnosis. Subperiosteal proliferation of the mandible, ribs, clavicles, long bones, and scapulas is typical. Long bone changes are characteristically confined to midshaft and do not extend to the epiphyses. Early, the subperiosteal calcific density is homogenous and approximates the density of cortical bone. Later, calcification becomes coarse and trabeculated and decreases in density and extent. A history of concentrated fish liver oil intake above normal requirements is the clue to correct diagnosis. This disorder may be mistaken for syphilitic periostitis, osteomyelitis, and even for bone cancer, as in one of the cases described here.

Pediatrics, Springfield, Ill.

7:607-740 (May) 1951

Congenital Anomalies. J. Warkany.—p. 607.

Comparison of Pulmonary Hyaline Membranes in Vagotomized Rabbits with Those in Newborn Infants. H. C. Miller, F. C. Behrle and D. M. Gibson.—p. 611.

*Action of Alloxan on Hypoglycemic Infant. J. E. Griffith Jr., R. L. Jackson and R. G. Janes.—p. 616.

Relation of O_2 Consumption to Circulation in Different Stages of Infantile Malnutrition. E. Kerpel-Fronius, F. Varga, J. Vönöczky and K. Kun.—p. 623.

Omphalocele. C. M. Burgess, J. Palma and W. A. Myers.—p. 627.

Chylous Ascites in Infancy: With Report of Case with Vitamin A Absorption Studies. D. Gribetz and A. Kanof.—p. 632.

Volumetric and Microscopic Pattern of Bone Marrow in Normal Infants and Children: II. Cytologic Pattern. P. Sturgeon.—p. 642.

*Endocardial Sclerosis: Review of Changing Concepts with Report of Six Cases. H. W. Edmonds and W. B. Seelye.—p. 651.

*Tricuspid Atresia: Report of Three Cases and Evaluation of Diagnostic Criteria. H. L. Abrams and R. H. Alway.—p. 660.

Auriculotemporal Syndrome: Report of Case Developing in Early Childhood with Review of Literature. W. Pfeffer Jr. and S. S. Gellis.—p. 670.

Galactosemia in Infancy: Report of Case with Observation for 24 Months. J. W. DuShane and E. E. Hartman.—p. 679.

Aureomycin in Treatment of Ruptured Appendices in Children. B. S. Joslin and M. E. Drake.—p. 684.

Nephrotic Syndrome in Rats. W. Heymann and H. Z. Lund.—p. 691.

Electroencephalography of Newborn Infant: VI. Studies on Premature Infants. J. G. Hughes, B. C. Davis and M. L. Brennan.—p. 707.

Prevalence of Heart Disease in Toronto Children: 1948-1949 Cardiac Registry. J. H. Gardiner and J. D. Keith.—p. 713.

Acute Hemolytic Anemia Due to Ingestion of Naphthalene Moth Balls. J. V. Mackell, F. Rieders, H. Brieger and E. L. Bauer.—p. 722.

Action of Alloxan on Hypoglycemia.—A female infant aged 8 months with severe spontaneous hypoglycemia and associated convulsions was not significantly improved with epinephrine injections, and a subtotal pancreatectomy gave only temporary relief. Intravenous injections of alloxan monohydrate were then given for 20 days. Initially, the patient was given 25 mg. per kilogram of body weight, but this dose was increased to 60 mg. per kilogram by the end of this injection period. The intravenous injections of alloxan produced no untoward systemic effects, but the veins were rapidly sclerosed locally. The child had no convulsions during the 20 days she was receiving alloxan and remained well for five days after this treatment but had severe generalized convulsions on the sixth and again on the ninth day after alloxan was discontinued. Consequently, a second course of alloxan treatment was started immediately. The dosage was eventually increased to 75 mg. per kilogram of body weight. After eight days of treatment there was no definite improvement in her blood sugar values, and all veins that could be used were sclerosed. As a final attempt large doses of alloxan (150 mg. per kilogram of body weight as a 0.6% solution) were given for three days by subcutaneous route. This method of administration proved painful, and the fluid was absorbed slowly and produced hard, indurated areas that occasionally broke down. The clinical course after alloxan treatment was uneventful. The patient remained well and free from convulsions. The blood sugar values showed improvement, and the glucose tolerance also was improved. The response noted in this child with alloxan therapy indicates that the initial dose should be approximately 55 mg. per kilogram of body weight until a mild hyperglycemia is produced. Fourteen months after the last injection of alloxan the child had remained free of convulsions and her social developmental age was considered to be within normal limits. Blood sugar values obtained during the 14-month interval were improved over the prealloxan picture, although values below the normal fasting level have been observed.

Endocardial Sclerosis.—Sudden death is reported in six infants between the ages of 3 days and 20 months, in whom hypertrophy of the left side of the heart, thickening, opacity, and milky discoloration of the endocardium and varying degrees of distortion of the cardiac valves were outstanding features at necropsy. The ages of these patients and the lack of evidence of postnatal infection or inflammation in the history, physical examination, and necropsy suggest that the lesions observed were the result of an antenatal process, the nature of which is not definitely established. Microscopic examination of the affected areas showed dense collagenous-fibrous tissue in the place of normal endocardium, obviously a change of considerable duration and possibly referable to the time of the actual formation of the heart. The syndrome was characterized by radiologically demonstrable cardiac enlargement, nondiagnostic murmurs, and sudden death in infancy. The older concept of an inflammatory pathogenesis of so-called fetal endocarditis is rejected in favor of developmental origin of the lesions. The more recently proposed term "endocardial sclerosis" is preferred by the authors. As a group the cases reported may represent a distinct species of congenital cardiac malformation, perhaps analogous to the group of transpositions of the great arterial trunks of the heart. Cases of left-sided endocardial thickening with valve deformity, such as reported here, may find a theoretical common denominator in terms of segmental variation in tissue differentiation. Extensive fibroelastosis in the truncus segment of the embryo produces normally differentiated aortic and pulmonic trunks. Similar but less pronounced fibroelastosis in a portion of the bulboventricular loop would represent heterotopia resulting in the lesions of endocardial sclerosis.

Triscuspid Atresia.—Tricuspid atresia is one of the cyanotic forms of congenital heart disease that may be alleviated if additional pulmonary blood flow is provided. Because the antemortem diagnosis of tricuspid atresia may lead to corrective cardiac surgery, the criteria for diagnosis must be clearly delineated. Persistent pronounced cyanosis, a concave left upper cardiac border in the anterior-posterior roentgenogram, absence of right ventricular enlargement in the left anterior-oblique projection, and the substantiating electrocardiographic picture of left axis deviation have been the generally accepted diagnostic criteria. Awareness of their limitations is desirable. Three cases of tricuspid atresia in infants aged 5 weeks, 4 months, and 6 months, respectively, are reported. Pott's operation was performed on one of the three patients at the age of 1 yr. and was followed by pronounced and lasting improvement. The patient is alive and relatively well at the age of 3. The two other cases were fatal, one of which was characterized by the absence of left axis deviation on the electrocardiogram and the presence of roentgenologic signs apparently consistent with an increase in the size of the right ventricle. Angiocardiographic studies, however, were suggestive of tricuspid atresia. Although in most cases the classic findings will lead to an unequivocal diagnosis, it must be recognized that the combination of a congenital cardiac anomaly of the cyanotic type with left axis deviation is by no means pathognomonic of tricuspid atresia. Conversely, the absence of left axis deviation on the electrocardiogram does not exclude the possibility of this disease. Similarly, roentgenologic studies need not be conclusive. The presence of an underdeveloped right ventricle may be obscured in the conventional examination. In atypical cases angiocardiography may be the only method of establishing the diagnosis conclusively. For the intensely cyanotic young infant whose immediate prognosis is poor, special diagnostic procedures should be performed, whenever conventional methods have failed to clarify the nature of the anomaly. Although some risk is attached to these procedures, the danger may be far less than in conservative management of such cases.

Postgraduate Medicine, Minneapolis

9:375-460 (May) 1951

Treatment and Prognosis in Leukemias and Allied Disorders. C. C. Sturgis.—p. 375.
Some Practical Pointers About Cross-Eye. E. Krimsky.—p. 383.
Preoperative Evaluation of Toxic Goiter Patient. W. P. Kleitsch.—p. 394.
Thyroid Disease Today. F. H. Lahey.—p. 400.
Medical Aspects of Hypertension. W. R. Adams.—p. 408.
Thyroiditis, Simple Goiter and Carcinoma of Thyroid. G. Crile Jr. —p. 412.
Causes and Treatment of Menopausal Bleeding. J. I. Brewer.—p. 419.

9:461-550 (June) 1951

The Bleeding Nipple. J. W. Cline and P. R. Westdahl.—p. 461.
Anorectal Examinations in General Practice. M. R. Hill.—p. 467.
Complications of Third Stage of Labor. R. E. Campbell.—p. 477.
Appendicitis and Cancer. C. Costello and J. Saxton.—p. 482.
Diagnosis and Treatment of Ileitis. C. W. Mayo.—p. 487.
Syndrome of Large, Pale Ovaries and Its Differentiation from Adrenogenital Syndrome and Cushing's Disease. R. B. Greenblatt.—p. 492.
Pathologic Physiology of Mitral Stenosis. R. V. Ebert.—p. 501.

Public Health Reports, Washington, D. C.

66:655-694 (May 25) 1951

Evaluation of Detergents: IV. Correlation of Washing Performance with Dissolving and Wetting Ability. C. C. Ruchhoft and F. I. Norris. —p. 655.
Poultry Diseases as Public Health Problems. C. A. Brandly.—p. 668.

66:695-724 (June 1) 1951

Tuberculosis Studies in Muscogee County, Georgia: III. Tuberculosis Mortality Following Community-Wide X-Ray Survey. G. W. Comstock and M. H. Burke.—p. 695.
Secondary Radiation Limits in Photofluorography. W. W. Van Allen. —p. 712.

66:725-756 (June 8) 1951

Weight Control—Simplified Concept. A. L. Chapman.—p. 725.
Sources of Morbidity and Mortality Material in Industrial Health. V. M. Trasko.—p. 732.
Poliomyelitis, Hospital Inquiry, England and Wales, 1949. W. H. Bradley and A. H. Gales.—p. 740.

South Carolina Medical Assn. Journal, Florence

47:157-186 (May) 1951

*Report on Safety and Therapeutic Effectiveness of Parenterally Administered Chloromycetin by Intramuscular and Intravenous Routes. V. Moseley and W. G. Baroody.—p. 157.
Common Pitfalls in Surgical Anesthesia. J. M. Brown.—p. 160.
Alcoholism, Challenging Problem of Today. O. R. Yost.—p. 162.
Radiological Diagnosis of Intracranial Tumors. H. S. Pettit.—p. 167.

Evaluation of Parenteral Chloramphenicol Therapy.—The clinical and therapeutic effects and the serum levels of chloramphenicol (chloromycetin®) were studied in 38 patients with various infections to whom this drug was administered intravenously and/or intramuscularly. The usual dose employed intravenously was 0.5 to 1 gm. of chloramphenicol in 2 to 4 cc. of acetyl dimethylamine added to 250 to 500 cc. of dextrose or isotonic sodium chloride solution and given at six-hour intervals. The same initial dose of chloramphenicol dissolved in acetyl dimethylamine but not diluted in dextrose or isotonic sodium chloride solution, with additional maintenance doses of 250 mg. to 0.5 gm. of chloramphenicol at six-hour intervals, was given intramuscularly. Results showed that chloramphenicol when dissolved in acetyl dimethylamine may be safely administered intravenously or intramuscularly. As yet, no ill effects by these parenteral routes, such as allergic or toxic reactions, were observed. There were no signs of bone depression or neutropenic reactions or evidences of hepatic or renal damage. Chloramphenicol was administered to some of the patients for three weeks by intramuscular route with no evidence of sensitization or toxicity developing in any during that period. Infants and aged persons as well as young adults were among the patients treated. This is the first reported instance in which chloramphenicol dissolved in acetyl dimethylamine was employed for intramuscular use. In most of the patients the response to intramuscularly administered chloramphenicol was satisfyingly prompt. The injection should be made deep in the muscle, so that local tissue necrosis will not occur and also so that discomfort at the time and site of injection will be reduced. Both the oral and the intramuscular routes showed the same phenomenon, in which the blood levels rose to their maximum concentrations up to the sixth hour after administration and then fell off sharply in the next two hours. When the maintenance dose, usually 250 mg., given either orally or intramuscularly, was repeated at six-hour intervals, a sustained level of 5 γ per cubic centimeter could be maintained day after day. Longer intervals between injections resulted in a decrease in concentration below that theoretically desirable.

Surgery, St. Louis

29:803-970 (June) 1951

Changes in Sympathectomized Extremity with Anesthesia. D. A. Felder, R. R. Linton, D. P. Todd and C. Banks.—p. 803.
Surgical Treatment of Varicose Veins Associated with Subcutaneous Fibrosis. A. V. Migliaccio and E. A. Ricci.—p. 811.
*Appraisal of Bilateral Superficial Femoral Vein Ligation in Preventing Pulmonary Embolism: Application of Procedure in 100 Controlled Cases of Fracture of Femoral Neck. W. H. Erb and F. Schumann. —p. 819.
Effect of Increased Arterial Blood Flow to Liver on Mortality Rate Following Hemorrhagic Shock. E. B. Hay and J. K. Webb.—p. 826.
Effect of Intravenous Sodium Dehydrocholate on Mortality Rate Following Hemorrhagic Shock. E. B. Hay.—p. 829.
Cystic Duct Stump Syndrome. J. H. Garlock and E. S. Hurwitt.—p. 833.
Experimental Method of Repairing Strictures Involving Common Hepatic Bile Duct at Hilus. J. R. Scheibe.—p. 842.
Occult Injury to Pancreas Following Splenectomy. I. D. Baronofsky, W. Walton and J. F. Noble.—p. 852.
Use of Iliopsoas Muscle and Autogenous Fascias in Repair of Certain Inguinal and Femoral Hernias. C. C. Burton.—p. 858.
Treatment of Fractures of Femur with Heavy, Large Cored, Three-Flanged Medullary Nail. J. O. Lottes.—p. 868.
Transsternal Approach for Exposure of Anterior Mediastinum: Report of Case of Constrictive Pericarditis in Which This Incision Was Employed. W. H. Muller Jr.—p. 885.

Bilateral Femoral Vein Ligation for Prevention of Pulmonary Embolism.—In 1,650 autopsies, 167 cases of pulmonary embolism were discovered, an incidence of 10.3%. The embolism was considered of sufficient magnitude to have at least contributed to the fatality in 87 patients. This would indicate that in roughly 5% of the cases in which autopsy was performed, pulmonary embolism could be considered as a major factor in the cause of death. The highest incidence (24 of the major embolic cases) was observed in the orthopedic department, so a group of cases from this department was selected for evaluation of bilateral superficial femoral vein ligation in preventing pulmonary embolism. In all, 100 patients with recent fracture of the femur were studied, of whom 50 were subjected to ligation and 50 were not. It appeared that in aged patients with fracture of the neck of the femur, bilateral superficial femoral vein ligation, in itself, does not lower the mortality rate due to pulmonary embolism nor the incidence of nonfatal pulmonic episodes. The ligation in such patients is frequently followed by thrombosis arising in the proximal femoral vein compartment, and pulmonary embolism is a common occurrence.

Virginia Medical Monthly, Richmond

78:223-280 (May) 1951

Carcinoma of Breast: Radical Mastectomy, Oophorectomy and Hormone Therapy. G. W. Horsley.—p. 226.
Stenosis of Anus of Functional Origin—Habitual Use of Laxatives. C. B. Morton II.—p. 232.
Present Trends of Collapse Therapy in Tuberculosis. G. A. Chapman and F. B. Stafford.—p. 236.
Some Aspects of Human Infertility. F. W. Sutterlin.—p. 239.
Some New Concepts on Treatment of Bleeding in Third Trimester of Pregnancy. T. C. Todd.—p. 246.
Torsion of Testicle. W. J. Frohbose.—p. 250.
Pregnancy in Bicornate Uterus Complicated by Incarcerated Non-Pregnant Horn: Case Report. W. J. Hagood and W. L. Eastlack.—p. 255.
Medical Psychotherapy. K. W. Berblinger.—p. 259.
Psychological Reaction to Unaesthetic Nose. W. L. Gatewood.—p. 261.

FOREIGN

Archives of Disease in Childhood, London

26:97-194 (April) 1951

Declining Birth Rate in Sweden. A. Wallgren.—p. 97.
Physiological Hyperbilirubinaemia in Newborn and Reservoir Function of Spleen. Y. Åkerrén.—p. 106.
Renal Function of Infants Delivered of Toxaemic Mothers. D. C. A. Bevis and S. F. Schofield.—p. 109.
Observations on African Children. E. A. Beet.—p. 119.
*"Growing Pains": Clinical Study of Non-Arthritic Limb Pains in Children. J. M. Naish and J. Apley.—p. 134.
*Oil Aspiration Pneumonia in Infancy. F. S. W. Brimblecombe, L. Crome and J. P. M. Tizard.—p. 141.
Localized Outbreak of Tinea Capitis (M. Audouini) in Northern Ireland. J. M. Beare and E. A. Cheeseman.—p. 149.
Congenital Hemihypertrophy with Lymphangioma. J. A. Williams. —p. 158.
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Two Cases of Atresia of Small Intestine in Newborn. A. E. Stevens. —p. 166.
Aneurysm of Ductus Arteriosus and Umbilical Haemorrhage in Newborn. B. Lennox and D. MacCarthy.—p. 169.
Congenital and Neonatal Thrombocytopenic Purpura. H. N. Robson and C. H. M. Walker.—p. 175.
Gangrenous Purpura and Its Occurrence in Meningococcal Septicaemia. H. G. Dunn.—p. 184.

"Growing Pains": Limb Pains in Children.—Limb pains occur oftener in children than in adults, and so such pains have been dubbed "growing pains." Yet the ages 8 to 12, when the pains are commonest, are one of the "filling-out" intervals between two periods of rapid growth. A further criticism of the term is that the commoner sites of pain do not correspond to the sites of maximal growth. Moreover, it appears improbable that pains as intermittent as those described could be related to a process as gradual as that of growth. Naish and Apley questioned 721 children in routine examinations at school clinics regarding the occurrence of limb pains. Thirty (4.2%) of the children were found to have persistent nonarthritic limb pains. By comparison with controls, a family history of rheumatic disorders was found to be significantly commoner in children with such pains. Minor emotional disturbances also seemed common. Most of the children with limb pains fell into one of two groups. First, diurnal fatigue pains occurred in children in association with exertion, fatigue, and postural defects. In this group emotional disturbances were common, and there was a family history of rheumatic disorders. Second, paroxysmal nocturnal pains occurred in children who were more stable emotionally but who came from families in whom similar pains were common. This familiar occurrence and the fact that cold and damp conditions seemed to play a part suggest the possibility of an abnormal familial response to atmospheric conditions, but positive evidence for this is lacking. These studies suggest that limb pains, even when manifest organic disease has been excluded, comprise more than one single clinical entity. Psychic factors play an important part, but this is only one facet of the problem. Data are required regarding familial responses to atmospheric changes, and the familial relationship, if any, between pain and psychic aberrations. The term "growing pains" should be discarded, since the pains have no demonstrable connection with growth.

Oil Aspiration Pneumonia in Infancy.—This paper reports the case of a boy who was hospitalized at 8½ months with a complaint of weight loss, stertorous breathing, and hyperhidrosis for one month. He was successfully breast-fed for three months and when weaned was given a half-cream proprietary dried milk preparation in six and then five feedings per day. He was also given one teaspoonful of cod liver oil daily and unsweetened orange juice, but the diet was seemingly inadequate. He became constipated and from the age of 6 months until his admission to hospital was given three teaspoonfuls of liquid petrolatum (medicinal paraffin) daily. From 7½ months his mother noticed that he had rapid, noisy breathing, especially at night. A roentgenogram of the chest revealed diffuse parenchymal inflammatory changes of a pneumonic type, but the possibility of lipid pneumonia was not considered until the post-morten examination, at which a thin film of oil was found covering the mucous surfaces of the trachea and bronchi. From chemical and histological examinations it became clear that liquid petrolatum was the oil mainly responsible for the pneumonia, but the finding in the air passages of large oil droplets staining with osmic acid suggests that a terminal aspiration of food fats may have occurred. The literature furnishes no information on the relative dangers of nasal or oral administration of medicinal paraffin to infants. In many cases both routes have been involved. However, it is clear from cases of lipid pneumonia like the one here reported, in which nose drops were not used, that oral administration alone may result in aspiration. A healthy infant may be able to take liquid petrolatum by mouth without harmful effects, but its use is contraindicated in infants who resist oil administration, who are suffering from dysphagia or cough, or who are debilitated as the result of illness or congenital deformity. These warnings also apply to the administration of cod liver oil.

Archivum Chirurgicum Neerlandicum, Arnhem

3:1-80 (No. 1) 1951. Partial Index

Surgical Experience of Cholelithiasis. W. F. Suermondt.—p. 3.
Aneurysm of Arteria Pancreatico-Duodenalis. L. W. van Ouwerkerk. —p. 11.
*Experimental Researches into Hypothermia as Aid in Surgery of Heart: Preliminary Communication. I. Boerema, A. Wildschut, W. J. H. Schmidt and L. Broekhuysen.—p. 25.
Experiments on Disturbed Micturition in Cases of Adenoma Periurethrale. J. Glazenburg.—p. 35.
Conservative Treatment of Perforated Peptic Ulcer. E. A. van Slooten. —p. 52.
One-Stage Resection of Thoracic Oesophagus for Carcinoma Localized Above Aortic Arch, Oesophagogastrostomy. J. F. Nuboer.—p. 57.

Hypothermia in Heart Surgery.—The difficulties and obstacles of intracardiac surgery are discussed, and means of overcoming them are evaluated. The devices designed to act as artificial hearts provide the oxygen-poor blood with oxygen and maintain systemic circulation, at least the portion supplying the brain. These apparatuses are complicated and in consequence are subject to disturbances that may quickly endanger life. Boerema and associates therefore decided to eliminate the need for an artificial heart by reducing as much as possible the amount of oxygen required by the brain and other tissues. They accomplished this by reducing the body temperature. They describe their own studies on animals and mention the efforts made by others to accomplish cooling. They found that by considerable cooling, the metabolic rate in animals dropped so far that the brain could dispense with the circulation of the blood for a period three times as long as is normally possible. There was ample time to open the heart, which had been almost drained of blood by clamping the venae cavae, and for performance of an intracardial operation under direct vision. This method may eliminate the necessity for an artificial heart in cardiac surgery.

Arquivos de Clínica, Rio de Janeiro

12:141-226 (March) 1951. Partial Index

*Nitrogen Mustard in Treatment of Hodgkin's Disease, Lymphosarcoma, Leukemia and Similar Diseases. J. de Lorenzo and P. Jannini.—p. 141.

Nitrogen Mustard in Hodgkin's Disease.—The authors administered nitrogen mustard to six patients with Hodgkin's disease, lymphosarcoma or myxoma. Intravenous injections of 0.1 mg. of nitrogen mustard per kilogram of body weight up to a total daily dose of 5 and 6 mg. were given either daily or every other day for a series of two to six injections. The three patients with Hodgkin's disease were in an advanced stage when the treatment started. The first patient has been under observation for three years. The disease was resistant to roentgen treatment, but after three series of nitrogen mustard treatments at intervals of several months, the patient was able to return to work. Several months after apparent cure his symptoms recurred intermittently, so that he required further treatment. A total of six series of injections was given in three years. He is now relatively well, his blood is normal, and he is still working. The other two patients were very ill when the treatment was started. They died from agranulocytosis after having received only two and five injections. One patient with lymphosarcoma of the pharynx and neck,

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An asterisk (*) before a title indicates that the article is abstracted. Single case reports and trials of new drugs are usually omitted.

who had not responded to roentgen treatment, improved after each of two series of injections and returned to work. He subsequently died suddenly from acute hemorrhage from the tumor. In the other patient with lymphosarcoma spectacular improvement occurred after a series of four injections. The patient was able to resume work, and is still working and in good general condition one year and nine months after treatment. The patient with roentgen-resistant myxosarcoma of the psoas muscle with pleuropulmonary metastases and with clinical symptoms and blood changes of angina agranulocytotica had a series of treatments in a week. Two weeks after treatment he died in collapse. In all the aforementioned cases fever and malaise disappeared and the tumors rapidly regressed after treatment.

British Journal of Social Medicine, London

5:1-72 (Jan.) 1951

Study of Weight Gain in First Year of Life. J. Parfit.—p. 1.
*Spread of Tuberculosis from House to House. J. Webb and A. Stewart. —p. 13.
Risk of Stillbirth in Twin Pregnancy Related to Sex and Maternal Age: Analysis of 90,386 Twin Maternities. C. R. Lowe and R. G. Record. —p. 34.

House to House Spread of Tuberculosis.—This investigation was induced by the observation that many tuberculous patients lived next door to one another. It was based on statistics for Northampton, which is comparable in standard of living and population structure to other towns of the same size in England and Wales. Over a period of 28 years (1921-1948) tuberculosis was reported from 2,871 houses. Approximately 20% of the affected houses were grouped by two or three. The number of next-door pairs of houses that would have been affected in a random distribution of the cases was calculated by formulas from the mathematical theory of the random distribution of points in one dimension. Allowance was made for differences between good, fair, and poor housing, but only the interrelationships of houses on the same side of a street were taken into consideration. The number of affected persons in houses next door to one another was found to be significantly greater than the number to be expected had the cases been randomly distributed. It was also found that for any period up to 12 years the number of pairs of cases reported from the same house and from next-door houses was significantly in excess of the number to be expected from pure chance.

British Medical Journal, London

1:1157-1216 (May 26) 1951

*Effect of Cortisone on Survival of Skin Homografts in Rabbits. R. E. Billingham, P. L. Krohn and P. B. Medawar.—p. 1157.
Inherited Immunity. H. J. Parish.—p. 1164.
Hypothyroidism in Childhood. F. Braid.—p. 1169.
*Experimental Study of 79 Cases Showing Early Post-Gastrectomy Syndrome. T. J. Butler and W. M. Capper.—p. 1177.
Thyroid Activity in Mental Patients: Evaluation by Radioactive Tracer Methods. M. Reiss, R. E. Hemphill, R. Maggs and others.—p. 1181.
Acute Unilateral Dacryoadenitis: Report of Four Patients. P. Wilson. —p. 1183.
Bornholm Disease. T. Geffen.—p. 1185.
Tuberculosis of Liver Treated with Streptomycin. I. D. Melville.—p. 1187.

Cortisone and Skin Grafts.—The daily subcutaneous administration of 10 mg. of cortisone acetate to adult rabbits of either sex weakens the primary healing of autogenous or homologous grafts, delays their vascularization and the cellular proliferation consequent on it, and retards their histological reorganization. The contracture of graft-bearing areas is retarded by cortisone treatment but proceeds eventually to the same degree as in untreated animals. The administration of cortisone lengthens the life of skin homografts in rabbits by a factor of three or four. This is thought to be due partly to a nonspecific reduction of the graft's ability to elicit an immune response but mainly to the reduction of the response itself. The survival time of homografts in rabbits already made specifically immune by an earlier grafting from the same donor is little lengthened by the administration of cortisone. It is therefore concluded that cortisone affects the systemic development rather than the local fulfilment of the immune response.

Causes of Post-Gastrectomy Syndrome.—To determine the cause of the unpleasant symptoms that sometimes follow partial gastrectomy, Butler and Capper studied 79 patients with post-gastrectomy syndrome after the Polya type of gastric resection. They found that several different mechanisms were involved. Distension of the jejunum with a balloon reproduced the sensation of central abdominal fulness but not the vasomotor effects, namely, the feeling of warmth, sweating, tachycardia, and palpitation, which are even more distressing. These were reproduced when a bag containing an amount of mercury equal in weight to that of a heavy meal was inserted into the remnant of the stomach, and they were relieved when the patient was shifted from the upright to the supine position. The shift in position did not, however, abolish the sensation of fulness due to the balloon. Splanchnic block abolished both types of symptom, suggesting that they are mediated by the sympathetic rather than by the vagus nerves. Radiologic examination following a barium meal demonstrated that inert substances such as barium are capable of producing the syndrome, that symptoms may occur before jejunal filling has begun, that there is no significant difference in the incidence of rapid or delayed emptying or afferent-loop filling in patients with or without the syndrome, and that there is greater descent of the gastric stoma in changing from the supine to the erect position in patients with the syndrome than in those without. Glucose tolerance tests showed no significant differences in the blood sugar curve of those with and without the early syndrome, so that hypoglycemia cannot be regarded as a cause of these symptoms.

Giornale di Clinica Medica, Parma

32:249-376 (March) 1951. **Partial Index**

Panhemagglutination at High Temperature, Cryoglobulinemia and Anomalies of Erythrocyte Sedimentation in One Case of Sepsis Lenta. V. Grifoni and G. Gasparini.—p. 249.
*Behavior of Hydrochloric Acid Secretion in Cardiopathies. D. Furbetta, V. Giunti and P. Solinas.—p. 277.
Roentgenologic Aspect of Traube's Tympany. W. Telò.—p. 287.

Hydrochloric Acid Secretion in Cardiopathy.—The hydrochloric acid secretion of the stomach was studied in 117 patients with cardiopathy, 41 with compensated mitral and 24 with compensated aortic lesions, 18 with compensated hypertension, 21 with decompensated cardiopathy, and 13 with various forms of compensated cardiopathy. The gastric juice was examined before and after meals; histamine stimulation was employed in patients with achlorhydria. The hydrochloric acid secretion was below normal in 67% of the patients, normal in 26.4%, and above normal in 6.6%. Two examinations of the gastric juice at intervals of 15 days showed a definite drop of the hydrochloric acid secretion in two patients in whom the cardiopathy continued to develop during the period of observation. Thus cardiopathy seems to be associated with hyposecretion of hydrochloric acid. It is suggested that this anomaly is caused by changes in the circulatory dynamics of the gastric secretive apparatus. It may be a manifestation of hypoxemia of the stomach tissues.

Journal of Physiology, Cambridge

113:129-398 (April 26) 1951. **Partial Index**

Pattern of Emptying of Human Stomach. J. N. Hunt and W. R. Spurrell. —p. 157.
Secretory Pattern of Stomach of Man. J. N. Hunt.—p. 169.
*Effect of Intra-Gastric Instillation of Meal on Gastric Function in Man. J. N. Hunt and I. Macdonald.—p. 185.
Electrical Activity of Cortex Accompanying Movement. J. A. V. Bates. —p. 240.
Stretch Receptor Discharges During Muscle Contraction. C. C. Hunt and S. W. Kuffler.—p. 298.
Estimation of Chorionic Gonadotrophin Using Male British Toad Bufo Bufo. J. F. D. Frazer and F. X. Wohlzogen.—p. 322.
Early Tension Relaxation During Muscle Twitch. B. C. Abbott and J. M. Ritchie.—p. 330.
Blood-Pressure Effects of Noradrenaline and Adrenaline with Special Reference to Their Antagonism by Ergotoxine and Other Blocking Agents. K. I. Melville.—p. 346.

Gastric Function After Gastric Instillation of Meal.—To determine the effect of afferent impulses from the mouth, pharynx, and esophagus set up during the swallowing of a meal on subsequent gastric response, experiments were performed in which the emptying and secretion of the stomach after a swallowed meal were compared with that after a meal introduced into the stomach through a tube. Observations on eight normal subjects indicated that the emptying process was not significantly influenced by the test procedure. It was concluded that the absence of afferent impulses from the mouth, pharynx, and esophagus did not modify gastric digestive activity in response to the pectin meal.

Lancet, London

1:1081-1132 (May 19) 1951

Disturbance of Pupillary Reactions. J. H. Doggart.—p. 1081.
Use of Phonocardiograph in Clinical Medicine. W. Evans.—p. 1083.
Action of Ascorbic Acid on Tuberculin-Sensitivity in Guineapigs and Its Modification by Dietary and Hormonal Factors. D. A. Long, A. A. Miles and W. L. M. Perry.—p. 1085.
Retropubic Prostatectomy: Review of 500 Cases. A. Jacobs.—p. 1088.
*Erythema Multiforme Exudativum Major (Stevens-Johnson Syndrome). D. W. Ashby and T. Lazar.—p. 1091.
Plasmosan: Synthetic Substitute for Plasma. W. R. Thrower and H. Campbell.—p. 1096.
Plasmosan in Prevention and Treatment of Shock. G. P. Arden, G. A. Mandow and F. J. R. Stoneham.—p. 1099.
First Known Fatal Case of Canicola Fever. J. W. Wolff, R. van Dam and J. E. Minkenhof.—p. 1100.
Coagulability of Irradiated Plasma. J. W. Lyttleton and L. Vallet. —p. 1102.
Deflation of Distended Bowel at Operation. A. G. R. Lowdon.—p. 1103.
Spastic Ileus in Presence of Mechanical Obstruction of Small Intestine. J. Grieve.—p. 1104.
Anginose Type of Glandular Fever: Report of Case Requiring Tracheotomy. I. M. Librach.—p. 1105.

Erythema Multiforme Exudativum (Stevens-Johnson Syndrome).—Ashby and Lazar point out that the eruptive fever, which, according to the description of Stevens and Johnson in 1922, is characterized by pleomorphous rash, ulceration of the mouth, purulent conjunctivitis, and severe constitutional symptoms, was not really a new entity, having been described by Hebra in 1860 under the name erythema multiforme exudativum. Other names under which reports of cases indistinguishable from Stevens-Johnson syndrome have been published are "ectodermosis erosiva pluriorificalis" and "dermostomatitis." More recently it has been shown that the skin need not necessarily be affected and that abacterial pneumonia may be a feature. The histories of four patients with this disorder, observed by Ashby and Lazar, are presented, and an additional 77 cases from the literature are analyzed. Sixty-nine of the 81 patients were less than 30 years old. The syndrome is rare after 50. The disease is much more frequent in men than in women (66 men and 15 women in this group). All patients had lesions of the mouth or lips. Conjunctivitis was present in 74 cases. Seven patients had corneal involvement; six of these were left with permanent visual defect (five totally blind). Of the 66 males, 30 had penile lesions and seven had urethral discharge. Skin eruptions were seen in 67 patients. The authors raise the question whether the Stevens-Johnson syndrome is a specific infectious fever with a single causal agent, possibly virus, or a nonspecific syndrome that may be produced by various noxious agents as a form of allergy. Obviously, it is an anachronism to suggest that cases first described in 1922, much less those described in 1860, were caused by sulfonamides. If aureomycin proves to be a specific cure for Stevens-Johnson syndrome, the theory of an infective etiology will be strengthened. The clinical difference between the severe eruptive fever with stomatitis and ophthalmia described by Stevens and Johnson and the mild skin disease of Hebra is so distinct that their relationship is questionable, but if the conditions are variants of the same disease, it is suggested that the suffix "Stevens-Johnson" be attached to the severe form of erythema multiforme and the suffix "Hebra" to the mild form.

Medicina, Buenos Aires

11:1-66 (Feb.) 1951. **Partial Index**

*Functions of Adrenal Cortex in Myxedema. F. A. de la Balze, F. C. Arrillaga and R. E. Mancini.—p. 25.

Functions of Adrenal Cortex in Myxedema.—Tests to ascertain certain functions of the adrenal cortex were performed in 11 patients with myxedema and spontaneous primary thyroid insufficiency. The patients were observed for two to 10 months. Before treatment the metabolism of water and electrolytes was normal, as was proved by the Robinson-Power-Kepler test. Elimination of 17-ketosteroids was greatly diminished in all patients. The number of circulating eosinophils was above normal, as compared to that in 102 normal persons. The subcutaneous injection of 0.3 cc. of a 1:1000 epinephrine hydrochloride solution caused a fall in the circulating eosinophils in seven out of the 11 patients. The fall in these patients was not so great as normal. The intravenous epinephrine test was done on three of these patients, and the results were similar to those of the subcutaneous test. In these three patients, eosinopenia was also induced by an intramuscular injection of (1) 20 mg. of corticotrophin, (2) 100 mg. of cortisone and (3) a subcutaneous injection of 15 mg. of methamphetamine hydrochloride (methedrine®). The results of the three tests agreed with those of the postepinephrine eosinopenia test, showing dysfunction of the glycogenic corticoids. The treatment consisted of administration of a daily dose of 0.10 to 0.25 gm. of powder of desiccated thyroid, until normal thyroid function returned. After treatment the postepinephrine drop in eosinophils was as great as normal in the seven patients in whom it was abnormal before treatment. The urinary 17-ketosteroids returned to normal values in one out of three patients in whom the determination after treatment was made. The authors believe that the functional corticoadrenal disorders that occur in the course of myxedema are due to a hypophysial disturbance that results in a diminished secretion of corticotrophin and of other corticoadrenal hormones.

Nordisk Medicin, Stockholm

45:579-626 (April 18) 1951. **Partial Index**

Air Disinfection in Public Institutions: Continued Tests. E. Gedda. —p. 583.
*Three Types of Pneumonia Treatment (419 Cases). J. B. Nielsen and T. Søttrup.—p. 585.
Chronic Bronchitis and Bronchial Asthma. H. Laursen.—p. 591.
Pulmonary Manifestations in So-Called Catarrhal Fever: Analysis of 647 Cases. T. Christiansen and V. Schmidt.—p. 593.
Antibodies Against Tubercle Bacilli in Benign Lymphgranulomatosis. J. C. Ulstrup.—p. 598.
Is Mantoux Reaction Reliable Sign of Tuberculosis Immunity? S. Frostad.—p. 600.
Subacute Bacterial Endocarditis Treated with Streptomycin. P. Hanssen. —p. 601.

Three Types of Pneumonia Treatment.—*In 419 cases,* Nielsen and Søttrup found that combined sulfonamide and penicillin treatment of pneumonia showed no advantages over sulfonamide treatment or penicillin treatment alone and that penicillin cannot be regarded as superior to sulfonamides in therapeutic effect. The Central Hospital in Randers, however, has adopted antibiotics (at present dipenicillin) as the standard method of treatment of pneumonia because of increasingly numerous reports of more or less marked side-effects associated with sulfonamides.

Revista Médica de Chile, Santiago

79:197-266 (April) 1951. **Partial Index**

*Diagnosis of Chronic Cor Pulmonale. L. Herve, M. Brodsky, F. Duran and others.—p. 197.

Diagnosis of Chronic Cor Pulmonale.—Herve and collaborators found chronic cor pulmonale in 32 patients out of a group of 116 adults with chronic bronchopulmonary diseases. The disease was secondary to chronic bronchitis in 11 cases, to bronchiectasis in 11 cases, and to silicosis, bronchial asthma, fibrous pulmonary tuberculosis, or emphysema in the remaining 10 cases. It was of the pure form in 10 of these cases and associated with coronary disease, arterial hypertension, or arteriosclerosis in 22. One case of a latent subclinical form was also encountered. The pure form developed in persons of an average age of 44. The duration of the bronchopulmonary disease, up to the appearance of the cardiac symptoms, was between one and two years, and right ventricular hypertrophy developed quickly. In three patients the cardiac disease assumed a malignant form comparable to the malignant form of arterial hypertension; in seven it was subacute. The associated form of the disease developed in patients of an average age of 63. The bronchopulmonary disease was of long duration, right ventricular hypertrophy developed slowly, and the symptoms of chronic cor pulmonale were often masked by those of the coronary or vascular disease. The latent form is extremely rare. The diagnosis of chronic cor pulmonale was mainly based on (1) the electrocardiographic changes, which showed preponderance of the right ventricle, (2) the results of cardiac catheterization, which showed pulmonary arterial hypertension, and (3) the results of the tests for anoxemia, either compensated or decompensated. In the differential diagnosis the following conditions must be considered: congenital heart diseases causing cyanosis, valvular defects, insufficiency of the right ventricle secondary to arterial diseases, and constrictive pericarditis.

Revue du Rhumatisme, Paris

18:167-238 (April) 1951. Partial Index

Study of Behavior of Chronic Progressive Polyarthritis and Ankylopoietic Spondylarthritis Treated with Cortisone. J. Forestier, A. Certonciny, F. Jacqueline and J. Saint-Marc.—p. 167.
Cortisone and Corticotrophin (ACTH) in Rheumatology: Results of Treatment in 58 Cases. S. de Sèze, J. Robin, P. Ordonneau and others.—p. 177.
*Undesirable Thromboembolic Effects of Treatment with Cortisone and *Corticotrophin (Pituitary Adrenocorticotropic* Hormone). F. Coste, P. Galmiche, B. Piguet and others.—p. 189.

Thromboembolic Episodes in Patients Treated with Cortisone and Corticotrophin.—The occurrence of thromboembolic complications during the course of treatment with cortisone or corticotrophin (ACTH) is reported in five patients between the ages of 21 and 69, one with polyarticular gout, one with rheumatic carditis, one with multiple myeloma, one with chronic progressive polyarthritis, and one with gouty hydrarthrosis of the knee. The thromboembolic episodes observed were a flare-up of coronary artery disease in the first patient, pulmonary infarction in the second patient, and phlebitis in the three other patients. Considerable shortening of the coagulation time was observed in two of the patients with phlebitis, and one of them showed persistent reduction of the coagulation time in spite of treatment with heparin. Similar observations were reported by Cosgriff and co-workers, who stated that the mechanism of this change in blood coagulation is not clear. Coste and coworkers agree with this statement but believe that an increase in the number of blood platelets (335,000 per cubic millimeter), which was observed in several of their cases, may play a part in the disturbance of the blood coagulation. Studies are to be continued in this respect. It seems that the higher the dose of the drug, the greater the risk of thromboembolic complications associated with the treatment of patients with cortisone or corticotrophin, particularly when predisposing factors, such as prolonged bed rest, postoperative shortening of the coagulation time, or cardiac failure are present. Treatment with cortisone or corticotrophin combined with prophylactic treatment with anticoagulants is indicated.

Settimana Medica, Florence

39:149-176 (March 31) 1951

Symptomatology and Diagnosis of Lumbar Sciatic Pain Associated with Herniated Intervertebral Disk. G. Fineschi and L. Giaccai.—p. 149.
*Effects of Chloramine Compounds on Tuberculous Lymphadenitis. M. Del Dotto and G. Scardigli.—p. 158.
*Clinical Contribution to New Treatment of Rheumatic Diseases with Extracts of Total Adrenal Cortex Combined with Vitamin C. D. Bassi and G. Zotti.—p. 162.

Effects of Nitrogen Mustard on Tuberculous Lymphadenitis.—Five patients with tuberculous lymphadenitis of hyperplastic type were given methyl-bis (beta-chloroethyl) amine hydrochloride (nitrogen mustard) injections in doses of 5 mg. every other day, with a total of six to eight injections. The diagnosis was established in four of the five patients by lymph node biopsy. Pronounced enlargement of the axillary and laterocervical lymph nodes was observed in three patients, and considerable swelling of the mediastinal lymph nodes in the two others. Previous treatment with calcium compounds, vitamins, arsenic, iodine, streptomycin, sulfone, thiosemicarbazones, ultraviolet rays, and, in one instance, roentgen irradiation of the mediastinum with two doses of 100 roentgens, had failed. The results of the treatment with nitrogen mustard were as follows: there was a diminution in the size of all the lymph nodes involved, a significant drop in the sedimentation rate, an improvement in general condition which still persists in two patients one year after treatment, and restoration of the temperature to normal. The reaction to the intracutaneous tuberculin test was increased. The white blood corpuscles in the peripheral blood did not undergo pronounced changes, and erythrocytes and hemoglobin remained normal. The authors stress the good results of nitrogen mustard treatment in caseous tuberculous lymphadenitis. The effect is more permanent than that obtained with the same treatment in malignant lymphogranuloma or in leukemic lymphadenosis.

Treatment of Rheumatic Diseases with Extract of Total Adrenal Cortex Combined with Ascorbic Acid.—Fifteen patients, five with subacute articular rheumatism, two with primary chronic polyarthritis, and eight with hypertrophic arthritis, were treated with intravenous injections of extract of total adrenal cortex combined with ascorbic acid. Thirty units of extract of total adrenal cortex and 0.50 gm. of ascorbic acid were administered daily for 10 days. Arterial pressure and blood sugar did not undergo pronounced changes; serum proteins tended to become normal; sedimentation rate, although not restored to normal, dropped, and the hemoglobin content of the blood was improved. Local responses to the treatment were best in patients with subacute articular rheumatism and moderately satisfactory in those with hypertrophic arthritis. Of the two patients with primary chronic polyarthritis, one obtained gratifying results, while treatment failed in the other. Improvement of the general condition was pronounced in all 15 patients. Untoward reactions, consisting of headache, tremor, and rise of temperature, occurred shortly after the first injection, subsided, and did not recur after the following injections. An anti-allergic effect of the treatment is suggested by the fact that the patients were rapidly benefited. The treatment may also have an anti-hyaluronidase action. The high value of the combination of ascorbic acid with extract of total adrenal cortex in the treatment of rheumatic diseases is stressed.

Transactions Royal Soc. Trop. Med. and Hyg., London

44:481-610 (April) 1951. Partial Index

Schistosomiasis at Lake Bunyonyi, Kigesi District, Uganda. J. Schwetz. —p. 515.
Transmission of Chagas' Disease to Australian Marsupial Trichosurus *Vulpecula*. T. C. Backhouse and A. Bolliger.—p. 521.
Efficacy of Certain Trypanocidal Compounds Against Trypanosoma Gambiense Infection in Man. A. J. Duggan and M. P. Hutchinson. —p. 535.
Diabetes Mellitus in Trinidad, British West Indies: Relationship of *Symptoms to Frequency* of Insulin Injections. J. E. O'N. Gillespie. —p. 545.
Broncho-Pulmonary Moniliasis. S. Zahawi and R. D. Semah.—p. 551.
Malignant Malnutrition in Fiji. P. E. C. Manson-Bahr.—p. 555.
*Sickle-Cell Crisis in Pregnancy: Two Autopsy Reports. G. M. Edington.—p. 559.
Evaluation of Synthetic Anti-Malarial Drugs in Children from Hyperendemic Area in West Africa. L. J. Bruce-Chwatt.—p. 563.
Sterilization of Cysts of Entamoeba Histolytica by Chemical Disinfectants, and Initiation and Maintenance of Pure Cultures in Association with Single Species of Bacteria. V. G. Rao.—p. 593.

Sickle Cell Crisis in Pregnancy.—Edington describes two cases of sudden death in African primigravidas. Necropsy revealed gross anemia of all organs except for the spleen, which was enlarged, slate blue in color, and packed with sickled erythrocytes. Reid described three similar cases of unexpected death in young African women dying shortly before or after delivery. Emphasis was laid on the enlargement of the spleen and the presence of the sickle-cell trait. There would thus appear to be a syndrome of sudden death: a young primigravida approaching term and regarded as normal suddenly becomes severely ill, with sighing respirations and signs of collapse. Delirium and death occur within two days. At autopsy the pallor of the mother's mucosae and organs contrasts with the dark red appearance of the enlarged, firm spleen and also with the organs and blood of the healthy child, whose hemoglobin level is normal. The histopathological findings exclude malaria and toxemia as causes of death but also differ from the usual descriptions of sickle cell disease in Africa, where emphasis is laid on congestion and thrombosis occurring in the organs utilizing most oxygen, namely, the brain and kidney. It is suggested that the cause of death was an acute sickling crisis, which may have been precipitated by (*a*) hemoconcentration occurring in the later months of pregnancy, and (*b*) the additional oxygen requirements of the child, causing a relative anoxemia in the maternal blood.

BOOK REVIEWS

Pharmacognosy: The Study of Natural Drug Substances and Certain Allied Products. By Robertson Pratt, Ph.D., Associate Professor of Pharmacognosy and Plant Physiology, University of California College of Pharmacy, San Francisco, and Heber W. Youngken, Jr., Ph.D., Associate Professor and Chairman for Pharmacognosy, University of Washington College of Pharmacy, Seattle. Cloth. $8.50. Pp. 644, with 67 illustrations. J. B. Lippincott Company, 227-231 S. 6th St., Philadelphia 5; Aldine House, 10-13 Bedford St., London, W.C.2; 2083 Guy St., Montreal, 1951.

Pharmacognosy might be defined as the science that treats of the study of natural drug substances and certain allied products. The need for the inclusion of the latter part of the definition signifies the broad field encompassed by this old, but constantly growing, ramification of the medical sciences. The manner in which the authors have been able to present scientifically the facts of such a large field in one textbook, and at the same time make the acquisition of these facts a pleasant literary pursuit, is very commendable and also unusual in a publication of this nature.

The authors make the interesting observation that the study of galls in plants has supplied information that has been applied in the study of growth in general and of tumorous growths in particular. As a result of these studies, plant physiologists may be on the verge of isolating, and perhaps identifying, definite chemical entities which not only serve to stimulate or regulate the rate of growth of tissues but also exercise control over the pattern of growth of the tissues.

The use of sapogenins, known to occur in reasonable amounts in hundreds of species of plants, is posed as a possible starting source for the synthesis of cortisone. It is also noted that research on these plant products might result in the development of new corticosteroid type drugs.

The study of pharmacognosy is fascinating, in view of the fact that the history of drugs and spices is inextricably interwoven with the economic and social life and customs of nations. The authors have done a splendid job of keeping this fact constantly before the reader. The section on antibiotics is an especially welcome addition to a pharmacognosy test as are the sections concerned with measures for pest control and control of fungi, weeds, and other plants.

Developing Democratic Human Relations Through Health Education, Physical Education and Recreation. First Yearbook, American Association for Health, Physical Education and Recreation. Cloth. $4.25. Pp. 562. The Association, 1201 Sixteenth St., N.W., Washington 6, D. C., 1951.

Selected as "the most crucial task facing all educators and leaders of youth today," this subject is developed in a series to which more than 40 writers and editors have contributed. In the introduction it is emphasized that the volume, designated as a yearbook, is only an initial statement of the problem.

Five sections make up the book. In the first section, the basic point of view is elaborated in four chapters that consider democratic behavior and leadership, and the relationships between health education, physical education, and recreation. Successive sections are devoted to development of programs for children, adolescents, older youth, and adults. In all of these, there is presented a four-chapter discussion of the environment, concepts and attitudes that are considered desirable and which should be developed, methods to be employed, and their evaluation.

Many top-flight workers in the field of education served on the editorial committee that provided over-all supervision of the task, and contributors of special chapters are also specialists in this work. Although an apology is offered in the introduction for differences of opinion that might be observed, there is a surprising unanimity among the writers, at least on the basic necessities.

In addition to extensive bibliographies at the end of each chapter, there is a composite alphabetical bibliography at the end of the book, representing a rich source for those wishing to go more deeply into the subject. The volume should be of interest and assistance to workers in this field.

Nutrition and Alcoholism. By Roger J. Williams. Cloth. $2. Pp. 82. University of Oklahoma Press, Norman, 1951.

In this small volume, Dr. Williams presents in nontechnical terms his concept that chronic alcoholism may be a manifestation of a nutritional deficiency. Support for this concept was gained from experiments with laboratory rats. When the animals were offered free choice of water and alcohol, there was considerable individual variation in the amount of alcohol consumed by each rat. However, mild nutritional deficiencies induced by marginal diets led to an increase in alcohol consumption, while correction of these deficiencies resulted in a loss of appetite for alcohol. In subsequent clinical trials, feeding of supplemental vitamins was shown to curb the desire for alcohol in a number of alcoholics. Dr. Williams does not claim to present a universal cure for alcoholism, and readers will doubtless take exception to some of his statements. Nevertheless, he does emphasize a provocative concept, namely, that subtle inborn differences exist between individuals in their fundamental body chemistry and that, as a result, there may be widely differing demands for essential dietary needs. As the author points out, it is not inconceivable that the lack or insufficiency of certain nutritional factors may be involved not only in alcoholism but in susceptibility to infectious diseases or in the etiology of diseases of obscure origin such as arthritis, multiple sclerosis, hypertension, insomnia, cancer, or mental disturbances. Such a concept offers intriguing possibilities in the form of a nutritional approach to the prevention and alleviation of disease.

Rice, Dietary Controls and Blood Pressure with Menus and Recipes. By Frances I. Seymour, M.D. Cloth. $2.95. Pp. 206. Froben Press, Inc., 1776 Broadway, New York 19, 1951.

Dr. Seymour had had an opportunity to observe the effects of the rice diet while undergoing treatment for hypertension. The volume is intended to furnish information to patients about to undergo this rather tedious treatment. Chapters 1 and 2 contain a brief discussion of the necessity for an examination and the various tests employed for diagnosis of essential hypertension. There are chapters devoted to the story of salt and of rice. A valuable feature of the book is the listing of diets for 100 days. The small volume is well written, and the discussion of the various components of the diet are well presented. The book is a worth-while contribution to the important subject of dietetic treatment of hypertension.

Begin Now—to Enjoy Tomorrow . . . By Ray Giles. Cloth. Pp. 57, with illustrations by Will Black. Published as public service by Mutual Benefit Life Insurance Company, P. O. Box 359, Newark 1, N. J., 1951.

Starting with the assumption that the financial aspects of retirement have been given adequate attention, this little volume presents practical suggestions on how to look ahead and set up a program that will be satisfying to both body and mind. In a chapter "What About Money?" the ways in which general expenses are reduced are described. Another chapter presents 10 rules of daily living that probably should be started at age 30 if one is to make the most of old age—or even reach the goal of 65. The volume has a refreshing, practical approach.

Kurzes Lehrbuch der Enzymologie. Von Prof. Dr.Phil. Theodor Bersin. Third edition. Cloth. 19.20 marks. Pp. 274, with 44 illustrations. Akademische Verlagsgesellschaft Geest & Portig K.-G., Sternwartenstrasse 8, (10b) Leipzig C1, 1951.

The latest edition of this well organized textbook for students of the biological sciences, which appears ten years after the second edition, covers the world literature through 1949. A 50-page section on the nature, preparation, dynamics, and biological role of enzymes is followed by 138 pages on individual hydrolytic enzymes and enzymes entering into redox reactions. The last 70 pages are about enzymes in respiration, nutrition, and metabolism of plants and animals, including man. Foreigners who use the work will appreciate the clear, direct style of the writing. There are excellent indexes as well as a full table of contents. The print, illustrations, and binding are good, but most of the paper is poor.

The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

QUERIES AND MINOR NOTES

OTOSCLEROSIS AND PREGNANCY

To the Editor:—*A woman of 34, gravida II, para I, has been treated for eight to 10 years by an eye, ear, nose, and throat specialist for otosclerosis. He advised her to avoid becoming pregnant. Now that she shows evidence of being pregnant again, he has insisted that the uterus be emptied. Both the patient and her husband would like another child. The history of dizziness started in the last trimester of her previous pregnancy, in 1938. After delivery, her dizziness became accentuated and became associated with nausea and vomiting. These attacks have been alleviated by the treatment that she received from the nose and throat specialist. I would appreciate an immediate answer.*

Milton H. Cohen, M.D., Lewistown, Pa.

Answer.—Concerning otosclerosis in pregnancy, Greenhill in his "Principles and Practice of Obstetrics" (10th edition) says: "Pregnancy sometimes unfavorably affects diseases of the ear, especially otosclerosis. This disease is a chronic nonsuppurative affection of the bony capsule of the ear surrounding the labyrinth which decreases the capacity to hear. The disease is progressive and heredity is an important factor. From a study of the literature Allen is convinced that difficulties in hearing during pregnancy are frequently overlooked or neglected. A family history of ear disorders should be had from every pregnant woman who experiences changes in hearing. Before progressive deafness is considered an indication for the interruption of gestation, a definite diagnosis of otosclerosis must be made. The otosclerotic condition must be studied during both pregnancy and lactation for counseling as to subsequent pregnancies. Allen believes that usually otosclerosis should not contraindicate marriage or a trial pregnancy, nor should it be considered an indication for therapeutic abortion in primigravidas. On the other hand, a multigravida may have considerable right to question the continuation of her pregnancy, if accurate otologic evidence obtained in previous pregnancies has shown definite and sustained loss of hearing. In Barton's series of 133 women with otosclerosis who experienced one or more pregnancies, 72 per cent suffered loss of hearing with the first pregnancy and 50 per cent with subsequent ones. Barton believes an abortion is never justified for these reasons: 1) The effect of pregnancy on otosclerosis is extremely variable and unpredictable; there is no exact relation between the two conditions. The effect of previous pregnancies is not an accurate index of the possible effect of subsequent ones. 2) The favorable effect of abortion on the otosclerosis is also inconstant. The progression of the deafness with pregnancy may or may not be arrested by abortion. 3) The disease does not endanger the life of the mother as do the accepted indications for therapeutic abortion; for example, tuberculosis, heart disease and toxemia. 4) This type of deafness is not the severe handicap that it once was, owing to the advent of modern hearing aids and the promise of surgical treatment.

"Since the fenestration operation is usually successful there is seldom need to perform a therapeutic abortion because of this condition.

"Sterilization or other eugenic measures are futile in the control of otosclerosis because the hereditary nature of the disease is not known accurately, because it is impossible to prophesy deafness of progeny and because the unfavorable effect of pregnancy on otosclerosis is not constant. In Barton's series, the patients had a 50 per cent chance of having successive pregnancies without further loss of hearing."

THROMBOSIS AND EMBOLISM

To the Editor:—*What is the greatest interval reported between thrombophlebitis and embolism?*

Erwin R. Kaback, M.D., *Otisville, N. Y.*

Answer.—The question cannot be answered categorically by quoting figures from the literature for the following reasons. First, roughly 50 per cent of pulmonary emboli occur before the clinical manifestations of venous thrombosis. The peripheral thrombus is silent and may grow by apposition after the pulmonary embolus. Second, cases like that of Strauss (cited by de Takats in Brahdy and Kahn's "Trauma and Disease" ed. 2, Philadelphia, Lea & Febiger, 1941, p. 115) of a man who died of pulmonary embolism three months after fracturing his patella, are clouded by the fact that the original thrombosis may recur and that the embolus may be due to a recent growth of an old thrombus or even to a silent unrecognized thrombus from the pelvis, from the opposite extremity or from the heart.

With these reservations one might state that an embolus may occur even years after an injury or after a thrombosis and still be causally related to it, provided, however, that in the interval one or more attacks of recurring thrombosis were recognizable. The fresh thrombus retracts from the wall and is then organized in two to three weeks. It is possible that the rate and extent of clot retraction have to do with embolization. (Quick and Hussey, *Science* 112:558, 1950.)

ALOPECIA TOTALIS

To the Editor:—*A 26 year old, single man has no hair on the body. He has been having this trouble about 10 years. He does not have any symptom of leprosy. Kahn and Wassermann reactions were negative. While he denies a history of syphilis, once, he said, he received more than 10 injections of neoarsphenamine and injections of male hormone. He has also used many kinds of stimulative ointments to the scalp and ultraviolet, which did not appear to be helpful. Please give me an accurate diagnosis and effective treatment.*

C. L. Chu, M.D., Sanator, S. D.

Answer.—It would appear that a person who has no hair on his body has what is known as alopecia totalis, the cause for which is not known. Repeated search for glandular deficiencies of one type or another and efforts at hormonal therapy have in the main been unsuccessful. In women with alopecia totalis the hair frequently grows back during pregnancy but again disappears completely when the child is weaned. In view of the fact that the cause of alopecia totalis is not known, there is no specific treatment for it, but it does seem advisable to encourage persons who have total alopecia to accept it, not to be ashamed of it: women especially should be encouraged to wear wigs.

PARADOXICAL EMBOLISM

To the Editor:—*An injured person claims that an embolus that occurred in the femoral artery was due to a blood clot that followed a minor injury to a vein in the left arm. The heart specialist claims that the embolus entered the right auricle, passed through the foramen ovale and then part of the clot entered the coronary and the other part lodged in the right femoral artery, causing an embolism which necessitated amputation of the right leg. Can you tell me whether any such case has been recorded?*

Robert M. Burns, M.D., St. Paul.

Answer.—The auricular system may stay patent after birth as a patent foramen ovale. This defect varies from a small slit, covered by a valvelike membrane, to a large oval opening. A systolic murmur is usually present with an accentuated second

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sound at the pulmonary area; occasionally the soft diastolic murmur of pulmonary insufficiency may be heard. Roentgenologically there is an enlargement of the right auricle, right ventricle and the pulmonary artery. The hilar pulsations may be accentuated. The electrocardiogram shows right axis deviation, and auricular fibrillation often occurs. All these findings, of course, presuppose a large defect.

Ingham (*Am. J. M. Sc.* **196**:201, 1938) reviewed the literature on paradoxical embolism and reported six cases, in each of which an autopsy demonstrated an embolus in transit through a patent foramen ovale.

Obviously, if the diagnosis of paradoxical embolus is to be maintained, one must search for in vivo evidence of patent foramen ovale, which may have to include cardiac catheterization; other frequent causes of embolism due to myocardial infarction or auricular fibrillation must be excluded. Paradoxical embolism constitutes roughly 1 per cent of cases in which sudden arterial occlusion occurs.

NEUROLOGIC COMPLICATIONS OF INFECTIOUS MONONUCLEOSIS

To the Editor:—*A 23 year old man had urinary retention. He had been sick for 10 days, complaining of sore throat, chills, fever and some stiffness of the neck, mostly on the right side. Examination revealed postcervical adenopathy on the right side, pharyngitis and tonsillitis. The temperature was 101 F. Laboratory data, including spinal fluid findings, substantiated the diagnosis of infectious mononucleosis with central nervous system involvement. Abdominal and cremasteric reflexes were absent; other reflexes were normal. Cystometric studies revealed an atonic type of neuromuscular vesical dysfunction, also seen on intravenous urography. What are the neurologic complications of infectious mononucleosis, the pathology and prognosis?*

Victor J. Mulaire, M.D., Stamford, Conn.

Answer.—Answers to this query are given in a recent paper on "Nervous System Involvement in Infectious Mononucleosis," by Bernstein and Wolff (*Ann. Int. Med.* **33**:1120, 1950). Apparently the nervous system is not often affected. Reports of 34 instances were collected among which were examples of serous meningitis, encephalitis, meningoencephalitis and acute polyneuronitis. In one instance the patient had difficulty in voiding as noted in the query. Since the disease rarely is fatal, few necropsy reports are available. Studies of the brain in three cases show the nonspecific changes of a viral-like infection (*Am. J. Path.* **23**:463, 1947; *Blood* **2**:217, 1947). The prognosis is good; complete recovery occurred in 85 per cent of cases.

TREATMENT OF BURSITIS

To the Editor:—*What is the percentage of cases of acute calcific bursitis cured by the following measures: (1) diathermy, (2) x-ray therapy, and (3) procaine hydrochloride injections into the bursa, with and without irrigation of the bursal sac? What are the results with these measures in chronic calcific bursitis?*

Benjamin H. Archer, M.D., New York.

Answer.—There are no acceptable statistics which would establish the efficiency of these various measures on a percentage basis in either acute or chronic calcific bursitis. Diathermy should not be used in acute bursitis, with or without the presence of calcium. Diathermy increases the hyperemia, and this is likely to cause an increase in pain. In acute bursitis with some calcium in the fluid within the bursa, elimination of tension due to the pressure of the fluid contents of the bursa affords the quickest possible relief. This can be obtained by injection of procaine and repeatedly needling the bursa to make small openings, so that the fluid can leak out into surrounding tissue, where it may be picked up by the circulation. The percentage of good results from this procedure would be about the same as results when two needles are used and saline or procaine solutions are washed through the bursa. A considerable number of orthopedic surgeons now favor the use of x-rays after procaine injections and fenestration of the bursa, with or without irrigation of the bursal sac. This combination has been successful in a high percentage of cases in which the condition was definitely acute.

In the older and truly chronic calcified bursa, conservative measures are less likely to be successful. Diathermy in this chronic phase may be soothing and may aid in the absorption of the calcified material. It should be noted, however, that old, dry, calcified deposits are rarely found in the bursae about the shoulders. These calcified deposits are usually within the tendon of the supraspinatus muscle. Most acute bursae associated with calcification are secondary to an injury of the fibers of the supraspinatus tendon, and it is in the torn or fragmented fibers of this tendon that calcification most often takes place. Since the bursa lies directly over the tendon, it is possible for some of the calcium to escape into the bursa through a small tear or rent in the bursal wall. In the old, chronic, calcified supraspinatus tendons, with or without persistent bursitis, the calcium is usually dry or of the consistency of cheese. In such instances it cannot be removed by irrigation, multiple needling, diathermy, or x-ray therapy. An operation for exposing the tendon and thoroughly excising the calcified areas and, when indicated, repair of the tendon is usually followed by relief of symptoms and complete cure.

FIBROUS CAVERNOSITIS

To the Editor:—*I have a 40 year old patient who has a small fibrous tissue area in the midportion of the penis, obliterating about 2 cm. of one section of the corpus cavernosum. He complains of pain at the site of the lesion and deformity of the organ on erection. There is no roentgen evidence of calcification. What is the most likely cause, other than injury, and what is the treatment?*

Hugh L. Houston, M.D., Murray, Ky.

Answer.—In all probability the penile lesion described is caused by fibrous cavernositis (Peyronie's disease). This lesion is generally regarded as resulting from a chronic inflammatory process in the sheaths or intracavernous septums of the corpora cavernosa. The fibrous process usually involves Buck's fascia and the adjacent tissues. One or more fibrous plaques, which are readily palpable as firm nodules of variable extent, may result. The lesion often causes penile deformity as described and in some cases is the cause of pain. The fibrous plaques can usually be distinguished from gumma or malignant lesions by the intense hardness of the area and the absence of other clinical data. As a rule the process gradually becomes circumscribed and the local symptoms subside. Good results have been obtained in some cases by surface applications of radium. A mixture of tocopherol acetates (tofaxin®) has been administered, 50 mg. three times daily, with variable results. This drug consists largely of synthetic vitamin E, the value of which is thus far unestablished. Although surgical excision has been employed, the results obtained have often been unsatisfactory.

HYPERGLYCEMIA AND FURUNCULOSIS

To the Editor:—*What is the significance of a fasting blood sugar of 140 mg. per 100 cc. in a 30 year old, obese male—weight 260 pounds (118 Kg.)—with furunculosis. He has no glycosuria normally. The dextrose tolerance curve is of the diabetic type, reaching 180 mg. per 100 cc. at 30 minutes, at which time there is glycosuria, 240 mg. at 1 hour and 180 mg. at 2 hours. Is insulin indicated?*

Wendell W. White, M.D., Faith, S. D.

Answer.—Hyperglycemia, both fasting and during a glucose tolerance test, accompanied by glycosuria implies diabetes. In this instance the furunculosis should be eliminated before a permanent diagnosis is made. If the patient cannot remain sugar free and have a normal blood sugar level on a diet of about 200 Gm. of carbohydrate, 1 Gm. of protein per kilogram and 80 Gm. or less of fat while the weight is being reduced to within at least 30 pounds (13 Kg.) of standard for his height, then he should take insulin.

JOURNALS ABSTRACTED IN THE CURRENT MEDICAL LITERATURE DEPARTMENT, MAY-AUGUST 1951

Titles have been listed or abstracts made of important articles in the following journals in the Current Literature Department of THE JOURNAL during the past four months. Any of the journals, except those starred, will be lent by THE JOURNAL to subscribers in Continental United States and Canada and to members of the American Medical Association for a period not exceeding five days. Three journals may be borrowed at a time. No journals are available prior to 1940. Requests for periodicals should be addressed to the Library of the American Medical Association and should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Thus most of these journals are accessible to the general practitioner.

*A. M. A. American Journal of Diseases of Children. Chicago.
*A. M. A. Archives of Dermatology and Syphilology. Chicago.
*A. M. A. Archives of Industrial Hygiene and Occupational Medicine. Chicago.
*A. M. A. Archives of Internal Medicine. Chicago.
*A. M. A. Archives of Neurology and Psychiatry. Chicago.
*A. M. A. Archives of Ophthalmology. Chicago.
*A. M. A. Archives of Otolaryngology. Chicago.
*A. M. A. Archives of Pathology. Chicago.
*A. M. A. Archives of Surgery. Chicago.
Acta cardiologica. Brussels.
Acta clinica belgica. Brussels.
Acta endocrinologica. Copenhagen.
Acta medica orientalia. Jerusalem.
Acta medica Scandinavica. Stockholm.
Acta radiologica. Stockholm.
Acta vitaminologica. Milan.
American Heart Journal. St. Louis.
American Journal of Clinical Pathology. Baltimore.
American Journal of Digestive Diseases. Fort Wayne, Ind.
American Journal of Hygiene. Baltimore.
American Journal of the Medical Sciences. Philadelphia.
American Journal of Medicine. New York.
American Journal of Obstetrics and Gynecology. St. Louis.
American Journal of Ophthalmology. Chicago.
American Journal of Pathology. Ann Arbor, Mich.
American Journal of Physiology. Baltimore.
American Journal of Psychiatry. New York.
American Journal of Psychotherapy. New York.
American Journal of Public Health. New York.
American Journal of Roentgenol. and Radium Therapy. Springfield, Ill.
American Journal of Surgery. New York.
American Journal of Syphilis, Gonor. and Venereal Diseases. St. Louis.
American Journal of Tropical Medicine. Baltimore.
American Practitioner and Digest of Treatment. Philadelphia.
American Review of Tuberculosis. New York.
American Surgeon. Atlanta, Ga.
Anesthesiology. New York.
Angiology. Baltimore.
Annales chirurgiae et gynaecologiae Fenniae. Helsinki.
Annales paediatrici. Basel.
Annals of Allergy. Minneapolis.
Annals of Internal Medicine. Lancaster, Pa.
Annals of Otology, Rhinology and Laryngology. St. Louis.
Annals of the Rheumatic Diseases. London.
Annals of Surgery. Philadelphia.
Annals of Tropical Medicine. Liverpool.
Annals of Western Medicine and Surgery. Los Angeles.
Archives of Disease in Childhood. London.
Archives des maladies du coeur. Paris.
Archives of Physical Medicine. Chicago.
Archivio "de Vecchi" per l'anatomia patologica e la medicina clinica. Florence.
Archivio di Chirurgia Ortopedica e di Medicina. Milan.
Archivos de pediatría del Uruguay. Montevideo.
Archivos uruguayos de medicina, cirugía y especialidades. Montevideo.
Archivum chirurgicum neerlandicum. Arnhem.
Arizona Medicine. Phoenix.
Arquivos brasileiros de cardiologia. São Paulo.
Arquivos de clínica. Rio de Janeiro.
Australian and New Zealand Journal of Surgery. Sydney.
Beiträge zur Klinik der Tuberkulose. Berlin-Heidelberg.
Beiträge zur klinischen Chirurgie. Munich-Berlin.
Biochemical Journal. London.
Blood. New York.
Boletín de la Asociación médica de Puerto Rico. Santurce.
Brain. London.
Brasil-medico. Rio de Janeiro.
British Heart Journal. London.
British Journal of Cancer. London.
British Journal of Dermatology. London.
British Journal of Experimental Pathology. London.
British Journal of Industrial Medicine. London.
British Journal of Ophthalmology. London.
British Journal of Plastic Surgery. Edinburgh.
British Journal of Radiology. London.
British Journal of Social Medicine. London.
British Journal of Surgery. Bristol.
British Journal of Tuberculosis. London.
British Journal of Urology. London.
British Journal of Venereal Diseases. London.
British Medical Journal. London.
Bulletin of the Johns Hopkins Hospital. Baltimore.
Bulletin of the New York Academy of Medicine. New York.
California Medicine. San Francisco.
Canadian Medical Association Journal. Montreal.
Cancer. New York.
Cancer Research. Chicago.
Cardiologia. Basel.
Chinese Medical Journal. Shanghai.
Chirurg. Berlin-Heidelberg.
Cincinnati Journal of Medicine. Cincinnati.
Circulation. New York.
Clinical Science. London.
Connecticut State Medical Journal. Hartford.
Delaware State Medical Journal. Wilmington.
Deutsche medizinische Wochenschrift. Stuttgart.
Diseases of Chest. Chicago.
Edinburgh Medical Journal. Edinburgh.
Electroencephalography and Clinical Neurophysiology. Boston.
Endocrinology. Springfield, Ill.
Experimental Medicine and Surgery. Brooklyn.
Gastroenterologia. Basel.
Gastroenterology. Baltimore.
Geburtshilfe und Frauenheilkunde. Stuttgart.
Geriatrics. Minneapolis.
Giornale di clinica medica. Parma.
Glasgow Medical Journal. Glasgow.
GP (Journal of American Academy of General Practice). Kansas City, Mo.
Gynaecologia. Basel.
Hawaii Medical Journal. Honolulu.
Helvetica chirurgica acta. Basel.
Helvetica medica acta. Basel.
Hoja tisiológica. Montevideo.
Hospital. Rio de Janeiro.
Illinois Medical Journal. Chicago.
Indian Medical Gazette. Calcutta.
Industrial Medicine and Surgery. Chicago.
International Journal of Leprosy. New Orleans.
Journal of Allergy. St. Louis.
Journal of American Medical Women's Association. Nashville, Tenn.
Journal of Applied Physiology. Washington, D. C.
Journal of Arkansas Medical Society. Fort Smith.
Journal of Aviation Medicine. St. Paul.
Journal of Bacteriology. Baltimore.
Journal of Bone and Joint Surgery. Boston.
Journal de chirurgie. Paris.
Journal of Clinical Endocrinology. Springfield, Ill.
Journal of Clinical Investigation. Cincinnati.
Journal of Clinical Pathology. London.
Journal of Experimental Medicine. New York.
Journal of the Florida Medical Association. Jacksonville.
Journal of Gerontology. St. Louis.
Journal of Hygiene. London.
Journal of Immunology. Baltimore.
Journal of the Indiana State Medical Association. Indianapolis.
Journal of Infectious Diseases. Chicago.
Journal of International College of Surgeons. Chicago.
Journal of Investigative Dermatology. Baltimore.
Journal of the Iowa State Medical Society. Des Moines.
Journal of the Kansas Medical Society. Topeka.
Journal of Laboratory and Clinical Medicine. St. Louis.
Journal of Laryngology and Otology. London.
Journal of the Maine Medical Association. Portland.
Journal of the Medical Association of the State of Alabama. Montgomery.
Journal of the Medical Association of Georgia. Atlanta.
Journal of the Medical Society of New Jersey. Trenton.
Journal de médicine de Lyon. Lyon.
Journal of Mental Science. London.
Journal of the Michigan State Medical Society. Lansing.
Journal of the Missouri State Medical Association. St. Louis.
Journal of National Cancer Institute. Washington, D. C.

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* Cannot be lent.

Journal of National Malaria Society. Columbia, S. C.
Journal of Nervous and Mental Disease. New York.
Journal of Neurology, Neurosurgery and Psychiatry. London.
Journal of Neuropathology and Clinical Neurology. Chicago.
Journal of Neuropathology and Experimental Neurology. Baltimore.
Journal of Neurophysiology. Springfield, Ill.
Journal of Neurosurgery. Springfield, Ill.
Journal of Nutrition. Philadelphia.
Journal of Obstetrics and Gynaecology of the British Empire. Manchester.
Journal of the Oklahoma State Medical Association. Oklahoma City.
Journal of Pathology and Bacteriology. Edinburgh.
Journal of Pediatrics. St. Louis.
Journal of Pharmacology and Experimental Therapeutics. Baltimore.
Journal of the Philippine Medical Association. Manila.
Journal of Physiology. Cambridge.
Journal of the South Carolina Medical Association. Florence.
Journal of the Tennessee State Medical Association. Nashville.
Journal of Thoracic Surgery. St. Louis.
Journal of Tropical Medicine and Hygiene. London.
Journal of Urology. Baltimore.
Journal of Venereal Disease Information. Washington, D. C.
Journal-Lancet. Minneapolis.
Kentucky Medical Journal. Bowling Green.
Klinische Monatsblätter für Augenheilkunde und für augenärztliche Fortbildung. Stuttgart.
Klinische Wochenschrift. Berlin-Heidelberg.
Lancet. London.
Laryngoscope. St. Louis.
Lyon chirurgical. Paris.
Medical Annals of the District of Columbia. Washington.
Medical Journal of Australia. Sydney.
Medicina. Buenos Aires.
Medicine. Baltimore.
Medizinische Klinik. Munich.
Medizinische Welt. Stuttgart.
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This is an index to all the reading matter in THE JOURNAL. In the Current Medical Literature Department only the articles which have been abstracted are indexed.

The letters used to explain in which department the matter indexed appears are as follows: "BI," Bureau of Investigation; "E," Editorial; "C," Correspondence; "ab," abstracts; the asterisk (*) indicates an original article in THE JOURNAL.

This is a subject index and one should, therefore, look for the subject word, with the following exceptions: "Book Notices," "Deaths," "Medicolegal Abstracts" and "Societies" are indexed under these titles at the end of the letters "B," "D," "M," and "S." Matter pertaining to the Association is indexed under "American Medical Association." The name of the author, in brackets, follows the subject entry.

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Acad.—Academy	*Indust.—Industrial*
Am.—American	*Inst.—Institute*
A.—Association	*Internat.—International*
Coll.—College	*M.—Medical*
Commn.—Commission	*Med.—Medicine*
Comm.—Committee	*Nat.—National*
Conf.—Conference	*Pharm.—Pharmaceutical*
Cong.—Congress	*Phys.—Physicians*
Dist.—District	*Soc.—Society*
Div.—Division	*Surg.—Surgery*
Found.—Foundation	*Surgs.—Surgeons*
Hosp.—Hospital	*S.—Surgical*

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79— 222	2	May 12
223 – 300	3	May 19
301— 418	4	May 26
419— 510	5	June 2
511 – 608	6	June 9
609– 692	7	June 16
693— 768	8	June 23
769 – 880	9	June 30
881 980	10	July 7
981 – 1090	11	July 14
1091 – 1178	12	July 21
1179 1274	13	July 28
1275—1366	14	August 4
1367—1458	15	August 11
1459—1546	16	August 18
1547—1674	17	August 25